MASTER'S THESIS

Designing a Relational Calibration Survey for Aligning Collaborative Processes through Action Research

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Designing a Relational Calibration Survey for Aligning Collaborative Processes through Action Research

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Julien Alain Hoornweg

ABSTRACT

Organizational partnerships exist in various forms to create mutual benefits such as a focus on core activities, improved service quality, a reduction in costs, or creating strategic innovations. A general belief among researchers is that information transparency, interdependence, and trustworthiness help improving the performance of partnerships. However, traditionally, more attention is given to formulating contractual agreements, while less consideration is afforded to the relational and operational realm.

Despite that partners often put significant efforts into drafting contractual agreements, dissimilarities are acknowledged. Failing factors such as a shortage of clarity and perceived obligations in partnerships are common, and therefore partnerships often do not produce what they are projected to deliver.

This research applied academic knowledge with managerial relevance in the development of a prototype. This prototype facilitates to create clarification on mutually perceived obligations and interdependencies and assesses mutually perceived trustworthiness among the partnership through a survey.

The results of the workability of the prototype were evaluated through the examination of the design requirements. As with many first attempts, some design requirements were operational, and some need to be further refined. Indeed, the prototype provides a first move towards a systematic method of requesting cooperation objectives and interdependencies, as it aids in identifying the collaboration objectives, interdependencies, and phasing of the collaboration.

KEYWORDS

Interdependence, Trustworthiness, Business Process, Interfirm Transactional Relationships, Information Transparency, Design Science Research, Action Research.

SUMMARY

A considerable amount of literature exists on how and why partnerships happen between organizations. Reasons for collaborating can be divided into the will to focus on core activities, improving service quality, reducing costs, or strategic innovations. Nevertheless, more than fifty percent of the partnerships do not realize the benefits they had expected, yet above eighty percent continue to involve themselves in partnerships.

There is much attention given to the development of robust contractual agreements, while frequently insufficient attention is given to the relational and operational realm. Indeed, successful collaborations between organizations appear to be more complicated than anticipated. Dissimilarities in perceived obligations, vague promises, and shortage of clarity are among the top failure factors in outsourcing relationships.

In the operationalization of this design science research, a Relational Calibration Survey was created through an action research approach, and various improvement considerations were devised throughout the development of this prototype.

Within this research, a prototype of a survey (The Relational Calibration Survey) is created that facilitates users to align their understanding of their partnership objectives towards one another. For this purpose, three frequently mentioned attributes of successful collaborations were operationalized. These attributes are; interdependency, mutual trustworthiness, and information transparency. The Relational Calibration Survey uses the concept of information transparency on mutual objectives, dependencies, roles, governance, and responsibilities. However, information transparency alone might aid in the efficiency of a partnership but does not make a collaboration successful.

Instead, information transparency is seen as an instigating factor for perceived trustworthiness and, therefore, mutually perceived trustworthiness is brought as an assessment construct in the prototype. Lastly, mutual interdependence was identified in the literature as an essential governing component for productive partnerships. Thus, the prototype uses the concept of information transparency on mutual objectives, dependencies, and evaluates mutual trustworthiness and perceived interdependence while obtaining operational information.

The results of the workability of the Relational Calibration Survey were evaluated through the examination of the design requirements. As with many first attempts, some design requirements were operational, and some need to be further refined. Indeed, the Relational Calibration Survey provides an attempt towards a systematic method of requesting cooperation objectives and interdependencies, as it aids in identifying the collaboration objectives, interdependencies, and phasing of the collaboration.

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GLOSSARY OF CONSTRUCTS

Action Research

Action Research is a research strategy concerned with the management of a change and includes close collaboration between practitioners and the researcher (Saunders, Lewis, & Thornhill, 2016).

Business Process

Business Processes are a coherence of activities and resources (Martin, Kusters, & Cuijpers, 2018). A business process is a concatenation that consists of activities that produce specific outcomes either in the form of products, services, or decisions (Allah Bukhsh, 2015). Resources execute those activities. Martin et al. (2018) categorize resources into Passive Resources and Active Resources. Passive Resources involves, for example, tools, parts, and documents, and Active Resources are, for instance, machines and information systems or people.

Business Process Modelling

Business process modeling is a graphical depiction of a business process (Kothari, 2019). A Business Process Model creates transparency since it provides the reader with an idea of how the process works. This research applied the Business Process Modelling technique of Martin et al. (2018) to produce a graphical representation of the developed prototype. Appendix 03b presents a comprehensive description of the employed Business Process Modelling technique.

Design Science Research

Design Science Research (DSR) is a methodology in which the researcher designs and assesses a solution (prototype) to a field problem based on a scientific methodology (Aken & Andriessen, 2011), and this methodology aims to develop innovative prototypes for relevant business problems (Dolak, Uebernickel, & Brenner, 2013).

Information Transparency

Information transparency is the degree to which information is disclosed, unambiguous (clarity), and accurate. Disclosure is the perception that relevant information is received on time, clarity is the perceived level of lucidness and comprehensibility of information received from a sender, and accuracy is as the perception that information is accurate to the extent possible given the relationship between sender and receiver (Schnackenberg & Tomlinson, 2016).

Interdependence

Interdependence is assumed to be a combination of coercive Power and non-coercive Power from Y. Liu, Li, and Zhang (2010), and dependency from Caniëls and Gelderman (2007). Whereas Power is one party's ability to control or affect another party's activities (Janssen, 2015), and dependence is the need to sustain a relationship with the partner to accomplish its objectives (Janssen, 2015; Shanmugan & Kabiraj, 2012).

Interfirm Transactional Relationships

An interfirm transactional relationship is a holistic representation of a collaboration between two or more organizations and considers that the contractual, the relational, and the operational perceptions link to each other at certain moments (Verstegen, Olink, Vosselman, & Martin, 2006). Appendix 06 illustrates how contractual, relational, and operational perceptions connect.

Trustworthiness

This research applied interpersonal trust from McAllister (1995), and trustworthiness from Mayer and Davis (1999). Interpersonal trust is the extent to which a person is confident and willing to act based on the words, actions, and decisions of another (McAllister, 1995). Trustworthiness is a trust initiator that may lead to decisions regarding the willingness to be vulnerable, which, in turn, renders into a variety of trusting behaviors (Mayer & Davis, 1999).

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1 INTRODUCTION

This chapter presents both practical and scientific motivation to conduct this research. The chapter begins with a background in which the personal preferences of the researcher are infused with scientific relevance. Further, the chapter describes the engagement of the scientific community on the subject and concludes with a description of how this research proposes to contribute towards a solution of a substantive business problem.

1.1 BACKGROUND

There is a considerable amount of literature available on how and why partnerships exist between organizations. Reasons for collaborating can roughly be divided into the will to focus on core activities, improving service quality, reducing costs, or strategic innovations (Dibbern, Goles, Hirschheim, & Jayatilaka, 2004; Oshri, Kotlarsky, & Gerbasi, 2015). Furthermore, partnerships can be considered as strategically essential or merely as a relief service (Bolander, Werr, & van der Valk, 2018). Hence, the influence on the operating results and contractual risks affect the interdependency which both partners have (Caniëls & Gelderman, 2007).

Literature suggests that organizations gain competitive advantages through inter and intra-organizational collaboration (Ali & Khan, 2016; Lane & Lum, 2011; Ylitalo, Mäki, & Ziegler, 2004), and researchers from multiple disciplines seem to settle that organizational trust and information transparency are beneficial for organizations (Dirks & Ferrin, 2001; Schnackenberg, 2010). It is assumed that contracts usually govern the mutual obligations within partnerships (Dibbern et al., 2004; Shaikh & Levina, 2019). However, when contracts cover the operations insufficiently, risk in the success of the collaboration is created. A partnership is an interdependent blend of relational, contractual, and operational realms, whereas every realm plays a vital role in the dynamics of a partnership (Verstegen et al., 2006). In other words, when a problem arises in the contractual realm, it affects the relational and the operational realm.

From a procurement perspective it is known that specifications at the start of a collaboration are often incomplete (Gelderman, Semeijn, & de Bruijn, 2015; Van der Valk & Rozemeijer, 2009), and from an operational perspective, it can be understood that the initial stage of a collaboration suffers from insufficient formal and detailed specifications (Kelly, Schaan, & Joncas, 2002). Although it is a problem, it may also be an opportunity to become acquainted with each other and to put the relationship and the operation first during this initial stage of the collaboration.

Ali and Khan (2016) argue that much attention is given to the development of robust contractual agreements, while insufficient attention is provided to the relational and operational realm. Several behavior patterns were found during the initial exploration of this research that made it possible to stimulate organizational trust. Indeed,

options such as a stakeholder dialogue (Kaptein & Van Tulder, 2003), information transparency (Schnackenberg & Tomlinson, 2016), and a strong reputation (McAllister, 1995) could all serve as an initiator for building mutual trust. Nevertheless, information transparency seemed especially promising as it is an initiator for both the relational and operational realm. In the relational realm, transparency may stimulate trustworthiness (Akkermans, Bogerd, & van Doremalen, 2004; Schnackenberg & Tomlinson, 2016), while in the operational realm, transparency could serve to create clarity (Schnackenberg & Tomlinson, 2016).

Organizational Trust can be divided into "competence trust" and "goodwill trust." Competence trust is the expectation that the partner has the right competencies to be equipped to complete the agreements (Nooteboom, 1996), while goodwill trust is the belief that the partner will act cooperatively and, consequently, will not act opportunistically (Verstegen et al., 2006).

The literature research has given considerable attention to the methodologies regarding the creation and measurement of organizational trust; however, measuring trust remains complicated as concepts of human judgment in the form of mental models (Jones, Ross, Lynam, Perez, & Leitch, 2011), membership functions, and rules are difficult to interpret (Martin, 2019). Nevertheless, the notion that information transparency aids in signaling trustworthy behavior is shared within the scientific community, and should be explained as the degree to which information is disclosed, clear, and accurate (Schnackenberg, 2010). Appendix 01 can be consulted for an in-depth analysis of trust, while the problem statement is a logical follow-up by redefining the problem from the mindset to find a solution to this problem.

1.2 PROBLEM STATEMENT

Successful collaborations between organizations appear to be more complicated than generally anticipated (Ylitalo et al., 2004), and success is elusive for many partnerships (Kelly et al., 2002). Schwarz (2014) mentions that "[…] a PricewaterhouseCoopers report found that 55% of service recipients reported that they did not realize the benefits they had expected, yet 81% stated that they would involve themselves in partnerships again". Moreover, Gefen, Wyss, and Lichtenstein (2008) claim that only half of all collaborations are successful, while Bamford, Ernst, and Fubini (2004) reported a success rate of only 53%.

The dynamic links within a transactional relationship may face a myriad of potential obstacles when two partners begin collaborating. Firstly, partnerships often concentrate on contractual and financial perspectives, and relationship building is left aside (Ali & Khan, 2016; Ylitalo et al., 2004). Indeed, misjudging relational challenges is common when organizations are involved in partnerships, and not concentrating on relational events such as trust-building is a missed opportunity (Kelly et al., 2002).

Secondly, a common factor for underperforming partnerships is dissimilarities in perceived obligations, and when conflicting expectations exist, partners may act differently from what is expected from them (Koh, Ang, & Straub, 2004), and a collaboration objective is a crucial characteristic for a relationship (Dekker, Donada, Mothe, & Nogatchewsky, 2019). Mutual obligations are often stipulated in the form of written contracts (Dibbern et al., 2004); however, since contracts are often incomplete (Gelderman et al., 2015; Lane & Lum, 2011; Verstegen et al., 2006), a difference in perceived obligations becomes perceptible in the operational realm. However, It might also be that risks do not lie in the act of collaborating itself but in whether both parties are working towards the same scope definitions and objectives (Plane & Green, 2012). Consequently, a partnership suffers then from the absence of transparency, which consists of information disclosure, clarity, and accuracy (Schnackenberg & Tomlinson, 2016).

Thus, vague promises, shortage of clarity, and a mismatch in perceived obligations are significant factors in failing automation outsourcing relations (Koh et al., 2004). Therefore, the question that arises is, "what are the reasons for holding back information?"

Observations as a consultant with partnerships in Business Intelligence related collaborations often depict a situation where the customer is unable to explain what is required, and the analysts lack the understanding of the business process of the partner to inquire accurate information. Nevertheless, stakes are often much higher in dynamic partnerships where organizations spend a considerable amount of resources on the partnership, and collaborative business processes might need to be created over time.

Indeed, challenges might also be industry-dependent, and one must be careful with making generic assumptions. Most analyzed reports on failing collaborations are strongly related to the IT-sector; however, while information on the success rate of Business Intelligence and Analytics (BI&A) projects alone remains limited. One of the few scientific papers found was that of Adamala and Cidrin (2011), and mention an estimated failure rate between 50-80%. According to this paper, complex Business Intelligence and Analytics (BI&A) problems are often organizational, such as not being correctly aligned with the strategic vision, which indicates a mismatch in scoping the operational objectives.

The critical success of Business Intelligence and Analytics depends on a myriad of organizational, procedural, technological, and infrastructural factors (Yeoh & Popovič, 2016). However, when Business Intelligence and Analytics are adequately executed, competitive advantages can be gained through the use of business intelligence and analytics (Božič & Dimovski, 2019).

Developing a practical solution for organizational, procedural, technological, and infrastructural factors surpasses the scope of this research. However, as with any initiative, a clear vision and a well-established business case are required (Yeoh & Popovič, 2016), and, therefore, it seems that creating transparency on the collaboration

objectives is a good beginning for this research. Furthermore, the obligations of both customers and suppliers should be mutually understood (Koh et al., 2004), and lastly, an agreement on clearly defined collaboration objectives is required (Bruce, Leverick, & Littler, 1995).

Realizing the business goals is repeatedly observed as one of the primary objectives of a partnership, and during the process, developing trust appeared necessary in all realms of a transactional relationship (Verstegen et al., 2006). However, instead of re-identifying problems in a partnership, this research focuses on a trivial but critical part of a partnership by seeking a solution to develop a mutually shared vision, and a well-established business case wherein obligations of both partners should be mutually understood.

1.3 RESEARCH OBJECTIVES

The tenet among researchers is that effective communication (Sarker, Ahuja, Sarker, & Kirkeby, 2011), information transparency (Pirson & Malhotra, 2011; Schnackenberg & Tomlinson, 2016), interdependence (Caniëls & Gelderman, 2007), and trust (Ylitalo et al., 2004) are contributing factors for successful partnerships. However, information transparency has gathered special attention within this research, since communication is a significant factor in the development in collaborative business processes, which may or may not need to be adjusted when starting new partnerships (Verstegen et al., 2006).

While it is ambiguous how each factor contributes to a successful partnership, it is inevitable that information transparency on the objectives, dependencies, roles, and responsibilities is relevant for successful partnerships. Researchers have spent a significant amount of attention in examining the numerous potential benefits of trust (Dirks & Ferrin, 2001). However, most researchers do not focus on operationalizing these constructs to help partnerships in the creation of mutual trust, and less attention goes to the development of a pragmatic mechanism to aid in the improvement of perceived trust.

This research concentrates on creating a process that supports users to compare, facilitate alignment of activities, and commitment to the partnership. The relevance for such an instrument can be found back in the challenges that come along when specifying professional services (Axelsson & Wynstra, 2002; Gelderman et al., 2015; Van der Valk & Rozemeijer, 2009). The results from the literature research, which can be read in paragraph 2.2 “Conclusion of the Literature Research,” provide scattered solutions such as creating an information-sharing attitude (Schnackenberg, 2010), holding stakeholder dialogues (Kaptein & Van Tulder, 2003), creating Service Level Agreements, (Axelsson & Wynstra, 2002) and periodically reassessing contracts (Gelderman et al., 2015). At the same time the literature research has provided the understanding that in order to be more successful in a partnership, at least, a clear understanding of the operational scope needs to be provided (Koh et al., 2004), which

includes a shared understanding of interdependencies (Caniëls & Gelderman, 2007), and the presence of mutual trust (Seppänen, Blomqvist, & Sundqvist, 2007).

1.4 RESEARCH QUESTIONS

The factors that are required for achieving success in a partnership are plentiful. However, to keep this thesis feasible within the appropriate time limits, primarily relational factors were considered as components to address to develop an initiating mechanism to increase the success of a partnership. First, the literature research focused on "how" collaborations can be successful. The research questions answered in the literature research are presented below.

- How can a partnership increase their success rate?
    - What factors are required for achieving success in a partnership?
    - When is organizational trust important for achieving success in a partnership?
    - How is organizational trust developed within a partnership?

While attempting to answer the above research questions in the literature research, as presented in Appendix 01 and 2.2 Conclusion of the Literature Research, there is evidence that it is a myriad of factors that play a role in the success of a collaboration. One of the factors that were analyzed in detail was trust, as according to Verstegen et al. (2006), trust is the connecting factor in transactional relationships. Indeed, corresponding to Seppänen et al. (2007), trust is one of the factors that is often mentioned as essential for the success of a partnership. The final research question, "How is organizational trust developed within a partnership?" started with an assessment of the proposed methodologies, summarized these options, and concludes with several suggestions to improve trust in a partnership. Examples of these suggestions were, for example, information transparency, clarifying the scope, and entering a dialogue with each other. The discovered suggestions in the literature research are presented in detail in Appendix 01. However, these suggestions are primarily presented as stand-alone solutions, but not as a process-based solution, nor have been assessed with partnerships in the field of Business Intelligence and Analytics.

Discussions held with actors in the Business Intelligence & Analytics sector (Appendix 08), and researchers who prefer design-oriented research, e.g., Worren, Moore, and Elliott (2002), demonstrate that there is a demand for solutions from both the scientific community and the business realm to solve a business problem with scientifically appropriate practices.

After the literature review was completed, the research did not have an over-the-counter answer to the question, "How can a partnership increase their success rate?". However, there were several suggestions that factors such as clarifying the scope and trust play an important role.

Consequently, a decision has been made by the researcher to examine for a solution from a process-based perspective that ensures that collaborations become more successful than they currently are. After all, Business Process Management is designed to improve business processes, and the calibration of business processes during collaborations is more complicated than business processes within a single organization (Zhao, Liu, Yang, & Sadiq, 2009), and the process of aligning with each-other does often fail to provide the expected results.

The objective of this research is to develop a process that identifies the collaboration scope, including shared goals, dependencies, and obligations, and while doing so, be able to assess the perceived trustworthiness and perceived interdependence within a partnership. The research questions answered through design science are presented below.

- What should a process look like that identifies mutual obligations and assesses perceived mutual trustworthiness within a partnership?
    - What issues/matters should business partners be transparent about to improve mutual trustworthiness?
    - Which of the analyzed constructs on trust and trustworthiness is most suitable for this prototype?

1.5 RESEARCH APPROACH

A design science approach differs from empirical research as it seeks to design something beneficial to solve a field problem. Design Science uses a design cycle, which is a process of producing iterative loops to create something new. This research consists of one full design cycle, and Figure 1 illustrates the stages addressed in a design cycle, which is further elaborated on in chapter 3.1 Design Science Research (DSR).

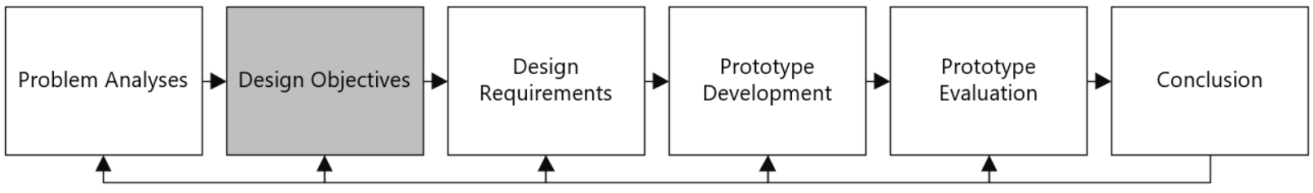


Figure 1 Design Objectives

The prototype is proposed to be used as a relational calibration instrument for assessing collaborative business processes. This implies that the prototype ought to be an instrument that helps to assess the fertility of a (potential) partnership.

The definition of fertility must be seen as the capacity to create a productive partnership and was assessed through the initial process phase, problem analyses, as illustrated in Figure 1. The problem analyzes comprised of iterative

loops of literature research and a process of frequently revising the problem statement. Chapter 1.2 Problem Statement delivers the findings of these iterative loops, and 2.2 Conclusion of the Literature Research provides the reader with the conclusion of the preliminary phase of this research.

1.6 MAIN LINES OF APPROACH

The introduction submitted a background to the dilemma that is discussed throughout this research. The subsequent chapters are structured as followed; first, chapter 2 elaborates on the applied literature research. Second, chapter 3 elaborates further on the found information from the literature research and continues with the research methodology, where design science research and action research are introduced. Chapter 4 manifests the design objectives, the chosen design decisions during the development and elaborates on the design requirements of the prototype. Subsequently, chapter 5 presents the evaluation of the prototype through the assessment of the design requirements. Lastly, chapter 6 finishes with a discussion of the outcomes and limitations of this research, restates the most important findings, provides a conclusion of this research and presents directions for future research.

2 LITERATURE RESEARCH

This chapter elaborates on the literature research process, which can be examined in 2.1 Implementation. Furthermore, full coverage of the analyzed literature can be obtained in Appendix 01, and the conclusion of the analyzed literature can be found in 2.2 Conclusion of the Literature Research.

2.1 IMPLEMENTATION

The following three phases depict the progress of the literature review has progressed. They indicate how many papers were found, how many of these were reviewed, and which among them proved relevant in order to be used within this research.

The first two phases of this research have given much consideration to the observation of the problem, in which general findings of the challenges that occur in partnerships have been established. The two initial phases of the literature research have focused on the questions “How can a partnership increase their success rate?” and “What factors are required for achieving success in a partnership?”. Upon gaining a general understanding of the factors that are required for achieving success in a partnership, the third phase expanded to the questions “When is organizational trust important for achieving success in a partnership?”, and “How is organizational trust developed within a partnership?”. This analyzes led to a “catalog” of factors that could contribute to improving the success

rate of a partnership. However, it is not a single factor that contributes to the success of a partnership but a blend of contractual, relational, and operational norms that should occur collectively.

2.1.1 Implementation Phase I: Exploration of the Topic

At the start of the research, neglect spotting, as described by Sandberg and Alvesson (2011), was applied by seeking for literature that is overlooked, under-researched, or lacks empirical support, and resulted in a (provisional) problem definition and general requirements. Besides, the conundrum was also approached from a practical perspective. In addition to purely scientific resources, the researcher has access to actual situations in which the previous discussion and problem area applies, which made it feasible to connect analyzed theories to practical collaboration problems. Thus, a combination of scientific literature and practical observations was employed to diagnose a problem definition that was both understood in the scientific community through the evidence of research papers and explorative interviews with professionals, as presented in Appendix 08. Table 1 supplies an overview of the used search refinements, and Appendix 01b provides a list of applied synonyms.

Search Refinements	**Phase I**	**Phase II**	**Phase III**
Refinement	Scientific Literature & Interviews	Scientific Literature	Scientific Literature
Journal refinement	Peer reviewed		
Time refinement	Preferable new articles less than five years old, no hard requirement.		
Language refinement	Dutch or English		

Table 1 Used Search Filters

2.1.2 Implementation Phase II: Systematic Literature Research

During the second phase, a general understanding of the research problem was formed. The researcher focused on Phase II on subject-specific secondary publications and applied a mixture of research methods, to acquire a well-considered understanding of the challenges described by both scientific literature and professionals who are daily involved in organizing collaborations. Figure 2 provides an overview of the used research methods. The OU Library portal, Research Gate and Google Scholar have been used for keyword research and based on the found literature, the reversed snowball method, as suggested by Levy and Ellis (2006), was applied.

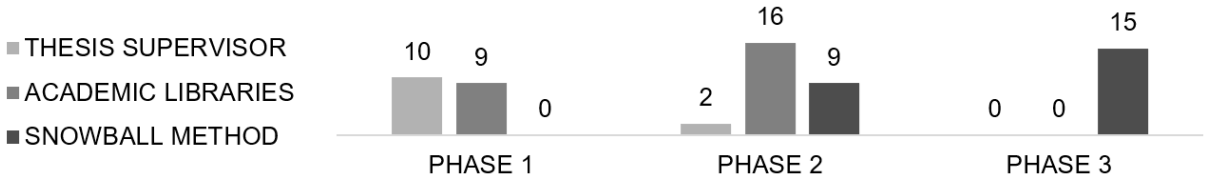


Figure 2 Search Methods Used Through the Research

Table 2 presents the requirement that a search result had to meet in this research, and appendix 01c provides a list of used search terms.

Requirements	**not read the abstract when:**	**not analyze the journal when:**	**analyzed the article when:**
Req 1: Search terms in abstract	✓	✓	✓
Req 2: Results of less than 100	✓	✓	✓
Req 3: Title relevant	×	✓	✓
Req 4: Abstract relevant		×	✓

Table 2 The Applied Research Strategy for Search Engines.

2.1.3 Implementation Phase III: Evaluating Search Results

During the third phase of the literature research, the aim was to find answers to the established problem statement that was established in the first diagnostic phases. The found articles were applied in the literature research and, where necessary, supplemented with additional scientific literature through the snowball method, and generic google scholar search exercises. Table 3 provides a summary of the scientific articles used, and appendix 01d provides the full list of analyzed literature.

Topic	**Phase I**	**Phase II**	**Phase III**	**total**
Introduction	7	9	19	35
Organizational partnerships	2	3	11	16
Organizational trust-building	1	5	10	16
Measuring organizational trust	-	4	6	10

Organizational trust	1	4	6	11
added after literature research	-	-	2	2
Literature removed from research	(16)	(24)	(21)	(61)
Total	10	25	53	88

Table 3 The Number of Scientific Articles Used Per Topic

2.2 CONCLUSION OF THE LITERATURE RESEARCH

This section establishes the conclusion of the literature research of which the current problem statement has been founded on, and concludes the initially raised four research questions;

1) How can a partnership increase their success rate?
2) What factors are required for achieving success in a partnership?
3) When is organizational trust important for achieving success in a partnership?
4) How is organizational trust developed within a partnership?

A detailed report of the foundations on which the conclusion of the literature research is established can be found in Appendix 01.

2.2.1 Main Results on RQ: What factors are required for achieving success in a partnership?

Schwarz (2014) describes collaboration success as the acquisition of additional capabilities, the timely achievement of objectives, the improvement of quality, and a mutually beneficial relationship. Adamala and Cidrin (2011) group success in organizational, procedural, and technological factors and mention that not all factors are equally complicated to work out. They mention that organizational and procedural factors such as aligning with the vision of the business and effective communication are harder to solve than technological factors such as data related factors and infrastructure-related factors and imply that much attention should be given to the organizational and procedural factors.

In Addition, attention to building relationships during the design and implementation of the collaboration is thought to be as vital for achieving success in a partnership (Kelly et al., 2002). Kelly et al. (2002) recommend being constructive in interactions with a partner and ensuring reliable communication links between partners.

Recommendations from the literature to achieve partnerships success are multifold and can be broken down into success factors in the contractual, relational, and operational realm. The contractual realm serves as a legitimate

power base for exercising control (Verstegen et al., 2006). However, contracts may never fully cover organizational agreements (Gelderman et al., 2015). The relational realm may then serve as a safeguard to cover the incompleteness in the contractual realm, and relational governance, such as the creation of trust, can be created in the relational realm (Verstegen et al., 2006).

The relational realm reveals a particular order and is closely related to the distribution of power and dependence (Kiewiet-Kester, 2008). When only one partner is dependent on another, a higher amount of trust is necessary, then when both partners are interdependent (Rousseau, Sitkin, Burt, & Camerer, 1998).

Operating results and the risks that the collaboration brings are interconnected to the distribution of power and dependence, and successful partnerships are characterized by mutual trust, commitment, and information transparency (Caniëls & Gelderman, 2007). Thus, further evidence from researchers such as Pirson and Malhotra (2011) and Schnackenberg and Tomlinson (2016) suggests that information transparency is understood as an initiator for mutual trust.

Indeed, the interaction between the relational and the operational realm could perhaps be the cornerstone for achieving success in a partnership, which supports the conclusion of Verstegen et al. (2006) that realms are connected, however, that the existence of trust or trust-building processes were involved. Thus, the next two research questions focused on the identification of the importance of trust when achieving success in a partnership.

2.2.2 Main Results on RQ: When is organizational trust important for achieving success in a partnership?

The literature demonstrates that trust is frequently mentioned as a crucial factor in a partnership, and researchers such as Kelly et al. (2002) and Ali and Khan (2016) emphasize that trust-building is essential from the moment a relationship starts.

- Firstly, Gelderman et al. (2015) mention trust in the supplier as fundamental because contracts will never completely foresee all required organizational agreements in advance, and Gefen et al. (2008) suggest that integrating trust management aspects into incomplete contracts as a substitute to the risk control mechanism.
- Secondly, Wynstra, Rooks, and Snijders (2018) suggest that having enough trust contributes to the reduction of search and tendering efforts.
- Thirdly, Lee, Heng, and Lee (2009) suggest that the existence of trust makes it simpler to share knowledge between business partners.

Within the organizational research literature on collaborations, trust is often mentioned as a crucial element in partnerships. Lane and Lum (2011) state that there must be bilateral trust and shared business goals in a successful

collaboration, and Ali and Khan (2016) consider mutual trust as an essential ingredient for successful partnerships. While trust seems to be beneficial on all organizational levels, most evidence was found when partnerships were executed on a strategic stage. McEvily and Tortoriello (2011) and Seppänen et al. (2007) present a wide variety of different studies in their reviews and recommendations on the use of trust items.

To conclude, within most partnerships, trust is desired. Evidence that trust is a significant factor for achieving success in a partnership was found in strategic partnerships (Ylitalo et al., 2004), outsourcing partnerships (Ali & Khan, 2016), and strategic innovation through outsourcing (Oshri et al., 2015).

Nevertheless, the definition of trust and, consequently, the measuring instruments often differ and are usually context related.

2.2.3 Main Results on RQ: How is organizational trust developed within a partnership?

Several researchers have assessed whether trust influences results such as performance and communication, and the impact of trust on performance and communication varied from modest to substantial (Dirks & Ferrin, 2001). According to Kelly et al. (2002), organizations must invest at the beginning of a partnership in the relational aspects such as establishing common grounds, assigning task definitions, and trust-building within a partnership, because it will later benefit the collaboration. While, Aulakh, Kotabe, and Sahay (1996), state that having shared organizational values helps with building trust between the partners, and Verstegen et al. (2006) perceive coordinating activities as intricately connected to developing mutual trust. Indeed, it is assumed that mutual trust demands effort and is developed over time (Aulakh et al., 1996; Kelly et al., 2002; Van Weele, 2010).

Researchers such as Schnackenberg and Tomlinson (2016), Mayer and Davis (1999), and Dibbern et al. (2004) consider trustworthiness as the initiator of organizational trust, and according to Akkermans et al. (2004) information transparency is an initiator for perceived trustworthiness, which in turn makes it possible to develop mutual trust. Nevertheless, the literature does not provide a specific answer about which information needs to be provided so that a partner is considered transparent.

Kaptein and Van Tulder (2003) emphasize that trust can be developed over time with structured stakeholder-dialogues. Structured stakeholder-dialogues stimulate transparency and concentrate on agreements that will be carefully documented. However, it should be noted that Kaptein and Van Tulder (2003) approached their research from the assumption that parties conflicted and therefore used a different foundation than this research, and from observations, stakeholders could be reluctant to spend significant time on a stakeholder dialogue when there is no sense of urgency.

From the acquired literature, it can be indicated that trust can be developed over time when organizations give attention to being trustworthy. Behavioral characteristics such as being transparent can lay a basis that a person is

considered trustworthy, which in turn is an ingredient for organizational trust. Nevertheless, much is still undecided, and it remains unclear about what should be transparent in a collaboration. In addition to transparency, reputation, and mutual experiences are seen as trust influencing factors (Young-Ybarra & Wiersema, 1999).

Several suggestions have been raised from the literature about how organizational trust is developed within a partnership. However, many partnerships fail (Koh et al., 2004), and a shortage of sharing, mutual understanding, or perceived interdependence can hypothetically be encouraged by improving mutual trust. Nevertheless, the literature studied mainly takes a diagnostic attitude towards the problem, while the problem persists.

However, this literature research has produced insights, and an action-orientated methodology can be employed. There is a demand for developing academic knowledge that has managerial relevance (Nenonen, Brodie, Storbacka, & Peters, 2017), and it is recognized that transparency stimulates trustworthiness and that relationships benefit when organizations address relationship-building from the start.

2.2.4 Main Results on RQ: How can a partnership increase their success rate?

Plenty of researchers have addressed the topic of partnership success and partnerships might increase their success rate with a variety of methods. Schwarz (2014) identified eight dimensions of outsourcing success, Kelly et al. (2002) listed several recommendations for a successful relationship, and Adamala and Cidrin (2011) gave recommendations on how collaborations within the Business Intelligence field could become more fruitful.

Several suggested methods on how to increase a partnership success were creating an information-sharing attitude (Schnackenberg, 2010), holding stakeholder dialogues (Kaptein & Van Tulder, 2003), creating SLA's, (Axelsson & Wynstra, 2002), periodically reassessing contracts (Gelderman et al., 2015), or creating the need to sustain a relationship with the partner to accomplish mutual objectives (Shanmugan & Kabiraj, 2012).

A cohesion between most analyzed literature was that mutual trust was frequently recognized as a contributing factor to the success of a partnership. Therefore, an increase in trust might increase the success rate of a partnership. Transparent behavior could be encouraged to improve trust since transparency is seen by plenty of researchers as an initiator for perceived trustworthiness, which in turn makes it possible to develop mutual trust.

Nevertheless, the term transparency is an ambiguous notion; therefore, in order to operationalize transparency, it is essential to give substance to the meaning of transparency between two parties. Koh et al. (2004) advises that an understanding of the mutual obligations between the partners is essential and at the same time other researchers such as Gelderman et al. (2015), Kelly et al. (2002) and Strijker-van Asperen, Drost, Stöteler, and van Tulder (2015) provided evidence that transparency on the specification of mutual requirements, promises, obligations, roles, and responsibilities is essential for the performance of collaborations.

Thus, conclusively, although different methodologies have been found to measure certain relational factors, the literature analysis has found no ready-made applications that can stimulate the success of a collaboration. As the success of the collaboration is strongly related to transparency, it would be beneficial to design a transparent working method that enables partners to understand each other through information-sharing, which seems to be both scientifically and operationally relevant, as there is adequate confirmation that plenty of partnerships remain prone to failure as a result of misunderstandings.

3 RESEARCH METHODOLOGY

There is a demand for developing academic knowledge that has managerial relevance (Nenonen et al., 2017), and scholars should increase emphasis on the development of prescriptive theories that can be tested by implementing it in organizational circumstances (Worren et al., 2002). To heed the calling, this research is seeking its roots in the philosophical tradition known as pragmatism, and the concept of design science research is methodologically applied.

3.1 DESIGN SCIENCE RESEARCH (DSR)

This research focusses on creating a prototype of a survey that facilitates users to assess the effectiveness and efficiency by evaluating their understanding of the partnership towards one another, and therefore the potency of the collaboration. The earlier phases of this research, as presented in 2.2 Conclusion of the Literature Research, did not deliver a solution towards the initial objective of this research, namely to find a ready to implement procedure that helps collaborating partners to specify their collaboration objectives, yet, much theoretical background was found to build towards such a process.

Therefore, a Design Science Research approach was employed. Design Science Research (DSR) differs from Conventional Social Science Research and has become an increasingly popular methodological approach, as it aims at developing new expertise in a field that has insufficient generic knowledge about a phenomenon (Aken & Andriessen, 2011). However, just like Conventional Social Science, Design Science Research can be approached from an inductive or a deductive foundation, and in reality, the researcher is suggested to use elements from inductive, deductive, and abductive methodologies (Gregory & Muntermann, 2011).

This research has concentrated on obtaining a validated solution for the described research problem, and most design choices have been based on inductive and abductive theorizing. Nevertheless, a testable solution was not detected in the literature research. Therefore, Design Science Research is most applicable; hence, the methodological framework introduced by Aken and Andriessen (2011) as visualized in Figure 3 has been used.

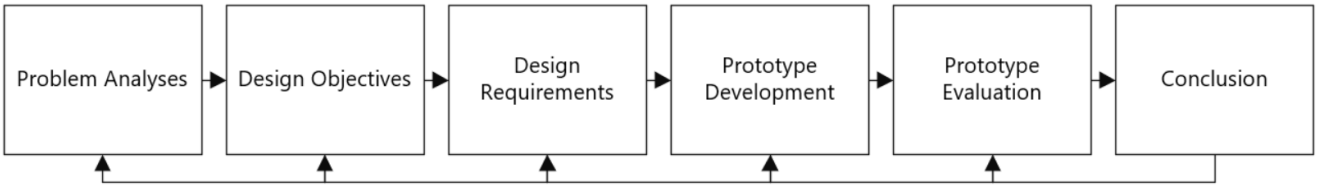


Figure 3 Methodological Framework for Design-Science Research

- Problem analyses: The problem analysis is comparable with that of empirical research. It is a combination of gap spotting in scientific literature, genuine business problems, and personal interest. Thus, within this research, several explorative interviews were held, and based on a problem statement, the scientific literature is examined, from which conclusions are drawn for field research.
- Design objectives: the literature research has not provided a solution to the diagnosed problem, and it would be advantageous that something new is developed on a scientific foundation. Therefore, a design objective is created to target that specific problem that needs to be addressed.
- Design Requirements: Design requirements are requirements set to be able to meet the design objectives. The Design requirements were developed through various iterations of literature analysis during the problem analyses and applied as evaluative directives to evaluate whether the prototype would work as intended.
- Prototype Development: The prototype development phase combines field knowledge with scientific literature. This combination of knowledge leads to the development of a solution in the form of a prototype.
- Prototype Evaluation: The prototype evaluation consists of the evaluation of design requirements to assess whether the prototype has met the design objective.
- The conclusion: The results of the Prototype Evaluation will be discussed, and for future research, the evaluation is concluded with a decision to what extent the prototype solved the diagnosed problem addressed in the problem statement and concludes with recommendations for improvement of the prototype (Aken & Andriessen, 2011).

3.2 METHODS OF DATA COLLECTION

While Design Science Research (DSR) offers a framework for developing a well-considered prototype based on scientific literature, this research also requires the appropriate methodological rigor that describes in which environment the research was conducted. This rigor is clearly described in the literature of Action Research, and researchers such as Nieveen and Folmer (2013), Järvinen (2005), and Gregor and Hevner (2013) have demonstrated a methodological correlation between the two research approaches. Indeed, Design Science

Research and Action Research are in many aspects closely resembling; they both are research methodologies in which there is a collaboration between the researcher and practitioners (Nieveen & Folmer, 2013). Therefore, it is plausible to assume that DSR must adhere to the rigor prescribed for Action Research.

The objective of this research is to achieve scientific rigor; therefore, a cyclical Action Research process of Susman and Evered (1978) was employed. The cyclical process consists of five phases: in the initial stages of the research, the problem is diagnosed, then an action plan is created on how this research is assessing the prototype, followed by the action taking in which the prototype is used, then based on the observations on how the prototype is used the prototype is evaluated and lastly based on the evaluation specified learning is applied within a particular research environment (Baskerville, 1997). Figure 4 illustrates the cyclical process of action research of Susman and Evered (1978).

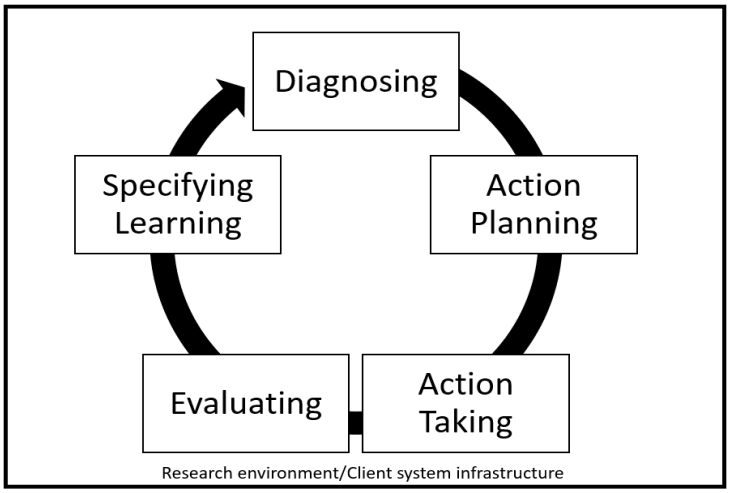


Figure 4 The Cyclical Process of Action Research (Susman & Evered, 1978)

When Action Research and Design Science Research are combined, the process steps of both methodologies will also have to be merged. Figure 5 combines these two models and offers a representation of how this research was conducted.

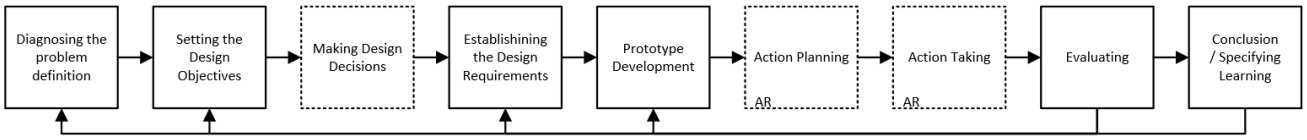


Figure 5 Action Research Applied to a Design Science Research process.

3.2.1 Research Environment

Action Research is conducted in a research environment, which is the environment the researcher has at its disposal to experiment with his intervention (Susman & Evered, 1978). The research environment ought to describe the environment, including a specification of responsibilities, boundaries within the research domain, and the entry and exit of the scientist (Baskerville, 1997). Thus, the selected research environment needs to be suitable for the validity assessment of the results of the prototype. Action Research is context-bound, thus, closely related to the essential logic of Case Study Research (Tetteh, 2015). Therefore, the first requirement of the research environment was to ensure that the information can be verified through interviews and knowledge of the outcome of the collaboration. While Action Research is not a case study, it appears that, for the selection of the Research Environment, the same case criteria, as suggested by Coyne (1997), could be applied in terms of time, location, events, and people. Indeed, prior information and considerable judgment were set as a prerequisite, which is comparable to a known property of intensity sampling (Patton, 1990). Therefore, the following requirements were drafted for the selection of a suitable research environment.

- All participants are aware of the collaboration objectives.
- All participants are aware of the phasing of the collaboration.
- Interdependencies are known to all participants.
- All participants are willing to share information, even if the information would be confronting
- The outcomes of the prototype can be validated through, e.g., triangulation.

To heed the requirements, an information-rich research environment was chosen, wherein the participating actors were aware of the collaboration objectives and interdependencies. A detailed description of this research environment can be found in Appendix 02.

The designated research environment is a cooperation between a Business Intelligence Service Provider and a Clinical Research Department. The Clinical Research Department has engaged the Business Intelligence Service Provider to partner through the implementation of their data strategy.

This specific partnership was selected bases on several factors. First, the partnership was the type of collaboration in which the researcher intended to use its prototype. Second, the partnership did not suggest any indications of

concern, in which the prototype could potentially evoke a complication[1]. Lastly, the actors within the partnership were willing to participate.

Additionally, within this research environment, there was also a clear division of roles; the researcher was in the lead when designing the prototype, he had developed the design objectives, design requirements, and the actual prototype, and upon completion, he discussed each of the deliverables with a participant within the research environment. The selected participant could, for convenience purposes, be an organizational scientist rather than an academic scientist by being primarily orientated towards a solution of the practical problem and consisted primarily of realism checks through discussions. Moreover, the two actors participated as test subjects. The test-subjects did not collaborate during the development of the prototype and were only involved during the action taking process, and the evaluation process of the research.

However, as the evaluation of this research has an emphasis on the assessment of the prototype, the central hypothesis of this research is directed towards the discovery of how well the design requirements have been met. As a result, a collaboration between two partners in the Business Intelligence & Analytics sector was used as the research environment.

3.2.2 Diagnosing

While the diagnoses have been described through the problem analyses, some additional text should elaborate deeper on the diagnostic methodology. The diagnosis of the problem consists of an iterative process of explorative interviews with BI&A professionals, re-examining the literature, and re-examining the aim of the design. The interviews were held with practitioners within the business intelligence field such as a project manager, a human resource manager, a solution architect, and two consultancy firm directors to assess whether the problem found in the literature was also considered a field problem in this industry. The transcripts of these interviews can be found in Appendix 08. The result was a well-established problem analysis, and a problem statement recognized by BI&A professionals and the scientific community.

3.2.3 Design Objectives, Design Requirements & Prototype Development

Based on the iterative process of diagnosing, a conclusion was reached and provided in 2.2 Conclusion of the Literature Research, and an explanation of the problem was given in chapter 1.2 Problem Statement. The next

[1] It is important to mention that the prototype, could be considered confronting, because the purpose of the prototype is to clarify collaboration objectives, thus, suppose a mismatch in the collaboration objectives exists, that could have consequences for mutual trust.

step was to identify the design objectives. Based on the problem analyses, the researcher sketched to overcome the challenges in collaborations identified in this problem analyses.

After the design objectives were established, and an initial attempt has been made to draw up scientifically based design requirements, the design objectives and design requirements needed to be assessed on practical realism. To obtain a suitable research environment, an initial draft of the prototype, including the design objectives and requirements were introduced to partnerships of interest, and thus, the research environment, as described in 3.2.1, was established.

3.2.4 Action Planning

Action planning refers to the strategy of how the prototype is introduced into the research environment (Baskerville, 1997). The objective is to introduce the prototype to the participating members within the research environment by allowing them to use the prototype within their partnership. The process of how the prototype is introduced into a collaboration was illustrated through the use of an activity model in Appendix 03.

3.2.5 Action Taking

Within this research, the process of action taking is executed by having the prototype used by a test-subject from both sides of the partnership. Action research focusses on action planning and evaluating, while design science concentrates on building and evaluating (Järvinen, 2005). Action taking is a method to evaluate whether the implementation of the planned actions performs within the research environment, and action-taking is, according to Van Burg (2011), the clearest test to determine the pragmatic validity of a prototype. Indeed, credibility and validity in action research should be examined through “action taking” concerning the context-specific problem resolution and knowledge production that causes a change (Tetteh, 2015). Indeed, the process of action taking ought to deliver verification whether the prototype works and performs how it is designed to do (Gregor & Hevner, 2013).

3.2.6 Evaluating

The prototype will be an instrument that acquires qualitative results. Qualitative results cannot be measured in absolutes, and most of the evaluation of design requirements can be executed through pragmatic validation. Pragmatic validity is essential for design science research and action research alike and can be determined by the extent to which objectives or intended consequences can be achieved by using the prototype (Worren et al., 2002).

Evaluating a prototype is accomplished by testing whether the prototype has met the design requirements. However, the challenge with prototypes that are designed to solve a social problem is that results are often filled with social luggage and cannot be quantified or expressed as a boolean value.

After receiving the results from the users of the developed prototype, a discussion was organized with the test-subjects of the research environment. First, the data were analyzed by the researcher. Later, the researcher distributed the results to actors within the research environment to cross-examine the practicability of the outcomes and invited them for a discussion of the results.

3.3 VALIDITY & RELIABILITY

Design Science Research and Action Research are evaluated in terms of validity and reliability, and both research approaches take on an action-orientated attitude towards the evaluation of an intervention (Järvinen, 2005). Peffers, Rothenberger, Tuunanen, and Vaezi (2012) suggests that the validity of a prototype could be assessed through testing the developed design and its underlying design requirements. However, traditional criteria for scientific validity do not guarantee the practicality of the prototype to practitioners of Design Science Research and Action Research (Worren et al., 2002), and therefore, validity through practice is often mentioned as an essential element of action orientated research approaches (Aken & Andriessen, 2011).

The validity of this research was established through the assessment of the design requirements within the research environment. This research is designed to gain convergent validity by triangulating the most crucial design decision, which is described in chapter 4.

Moreover, the prototype was reviewed in several stages of the design by members of the research environment, with the aim to give their pragmatic judgment as to whether the prototype performs as it was designed to do.

To demonstrate the accuracy of the claims made within the research, design requirements have been established through design decisions and evaluated by using the prototype within the described research environment.

Reliability must be accompanied by validity, and the reliability of the prototype indicates that the information asked will yield the same results if the actors from within the research environment would use the prototype at different moments in time. However, the prototype can only be used once for the first time, making it impossible to reproduce the results in this research environment exactly. That is why reliability is limited to testing whether the prototype measures what it is attempting to measure. As a result, a number of actors from outside the research environment were requested to complete the Relational Calibration Survey, and following that, it was analyzed whether the answers given were representative of the question.

Furthermore, to assess the reliability, the results of the prototype were discussed after the actors had completed the prototype. Consequently, all formal conversations were transcripted, verified, or recorded. Trackability and reliability are related, as reliability refers to the absence of accidental errors and is often defined as reproducibility

(Nieveen & Folmer, 2013). Therefore, a trail of evidence was created through design decisions, recordings, and transcripts discussions.

4 DESIGN DECISIONS

As a component of creating a design, the design objective was determined after the problem definition was concluded. The design objective is a predetermined target that the researcher attempts to achieve. Various decisions were made by the researcher based on both scientific literature as well as consultations with members within the research environment. The combination of both theoretical reflection and practical consultations is an essential part of action research (Baskerville, 1997; Saunders et al., 2016) since it increases the possibility to scientifically create a validated solution that has pragmatic realism (Worren et al., 2002). The following paragraphs introduce the design objective and describe design decisions that were essential to the drafting of the design requirements.

4.1 DESIGN OBJECTIVE

The design objective is to create a survey that requests the objectives, dependencies and the relational health of the collaboration, in such a way that a mediating party can compare the relational objectives and facilitate in the alignment of interests, stakes, and commitment of the actors that have followed the presented Relational Calibration Survey.

To illustrate, misalignment may occur when parties have different perspectives about what they would like to accomplish with the partnership, e.g., ad-hoc vs strategic goals, or it might be unclear as to which partner is responsible for what task. Thus, if roles and responsibilities are not clearly specified (Koh et al., 2004), or the objectives are not well understood, misalignment might threaten the partnership (Strijker-van Asperen et al., 2015; Verstegen et al., 2006). Therefore, both partners need to be periodically assessed on whether their objectives are still aligned. Thus, I propose to inquire the objectives, dependencies and the relational health of all the collaborating parties through the use of the Relational Calibration Survey.

Making this prototype consisted of coordinated choices with iterative loops resulting in a set of requirements on which the prototype was built. The process involves brainstorming, diverging, converging, repeating, and composing. Figure 6 illustrates the iterative loops of diverging and converging until a process was created that met the design objective and could, therefore, be evaluated with the selected research environment.

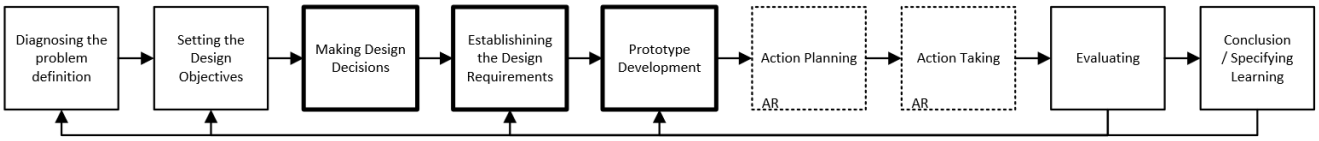


Figure 6 DSR: Design Requirements and Prototype Development

Moreover, it is also relevant that the prototype is given a name. Naming makes the prototype recognizable and provides the reader clarity as to whether the specific prototype made is being discussed in the research, or whether the discussion is over a general prototype is being discussed. Thus, to provide further clarity, the prototype created within this research is called a Relational Calibration Survey.

4.2 Decision 01: Operationalization of the Collaboration Phase and Objectives

Creating efficiency focusses on the idea that all partners are working towards producing the intended outcome. However, when it is unclear whether all partners have the same expected outcomes in mind, there is a chance that a partnership does not function in the best possible manner by being efficient regarding time and effort. Indeed, collaborating is not a goal in itself, but it serves as a possible solution for achieving an objective (Kaats, van Klaveren, & Opheij, 2005), and if that objective is not aligned, it is a gamble whether the partnership functions at its best.

Value can be created in numerous ways through collaborations, such as innovation, new knowledge, better performance, cost reduction, productivity, efficiency, or effectiveness (Lee et al., 2009). The assumption is that the generic objective of each formal partnership is to create value. The supposition is that the goals of a partnership should always be directed at the increase, the reduction, or a change in the projected output. Therefore, the assumption is that if the collaboration partners do not have the same perception of the expected output, the collaboration is not effective. Consequently, one dimension created in the prototype is the expectation of the output or, in other words, the collaboration objective.

Thus, once a partnership is about to occur, the Relational Calibration Survey must be able to identify whether the partners recognize the same collaboration objectives, namely;

- When an objective is to "increase," something new will have to be developed, and will have to be made from scratch. This type of objective is characterized by the fact that a pure form of innovation is often needed, and that something must be developed that has not been done before. An example is when a collaboration partner would want to add specific business processes to increase operational efficiency (Božič & Dimovski, 2019), and the execution could be that new business processes must be created.

- Furthermore, the purpose of “changing” suggests that improvement must be made to an already existing business process. This phase is characterized by something that already existed and which needs to be changed and often aims at efficiency or effectiveness. Thus, the name "to change" was used in the prototype to address collaborations wherein optimizing internal business processes is the objective.
- Lastly, the objective of “reducing” is to do less than before. The objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. The difference between "changing" and "reducing" is that the primary purpose of "reducing" is a reduction, while "changing" often aims to improve. An example would be minimizing internal business processes, e.g., at a reduction in licensing costs, reduction of human capital, or the abandonment of specific Business Processes.

The second dimension is time. Time can be measured in, e.g., days, months, or years, but can also be measured in different partnership phases. Collaborations in Business Intelligence & Analytics are often project-driven, and projects usually have a beginning and an ending. Phases of projects consist of an initiation, definition, execution, and closing phase (Bos, Zuiker, & Harting, 2006). However, before a project starts, it must at least be ascertained that there is a problem for which it is thought that a project can be a solution. Bos, Loon, and Licht (2013) describe this phase as the improvisation phase or a creative process. The improvisation phase aims at obtaining a direction towards the solution, and the creative process aims at gathering insights on an issue upon which can be performed. The researcher believes that it is relevant that the collaborating organizations know in which phase they are cooperating, even if it is only to be able to recognize each other's expectations. Thus, knowing the collaboration phase creates clarity. Therefore, when it is transparent to which direction the companies vision leans, it is necessary to understand to what extent the partner is inquired to cooperate. Consequently, in order to assess in which phase of the value creation process the collaboration is scoped, and in which stages of the value creation process the partnership will remain, four collaboration phases were addressed; the brainstorming phase, the converging phase, the planning phase, and the executing phase.

- “The brainstorming phase” is divergent thinking in its purest form. The problem or challenge is apparent, but there is still little insight into what exactly needs to be achieved (Bos et al., 2013). The brainstorming phase can be compared to the dreamer phase of Disney's creative strategy and is aimed at the creation of ideas without being limited by restrictions. Moreover, due to the concept that ideas should not be judged in this stage and based on the assumption that a certain level of trust is required when brainstorming together, the theory of being susceptible without being criticized during brainstorming is necessary.
- In “the converging phase,” the ideas are expected to be feasible and require a different way of thinking. This phase is called the realist phase in Disney's creative strategy of Dilts (2001), which converges ideas towards conceptual objectives. Bos et al. (2013) suggest that the actors involved in the planning phase, such as the project manager, should be involved.

- "The planning phase" starts when it is understood what needs to be done and begins often based on a business case. The actors start arranging resources, focuses are on the development of a roadmap, and ideas are converted into an implementable plan.
- "The execution phase" is the last phase of an initiative, and operations are executed in this phase. Actors work towards the realization of the converged ideas by following the plans created in the planning phase.

The completion of both dimensions led to the development of a matrix that aims to visualize the phase of a collaboration on the horizontal axis and the objective of the partnership on the vertical axis. The Matrix is visualized in Figure 7, and its utilization is further explained in Appendix 08b.

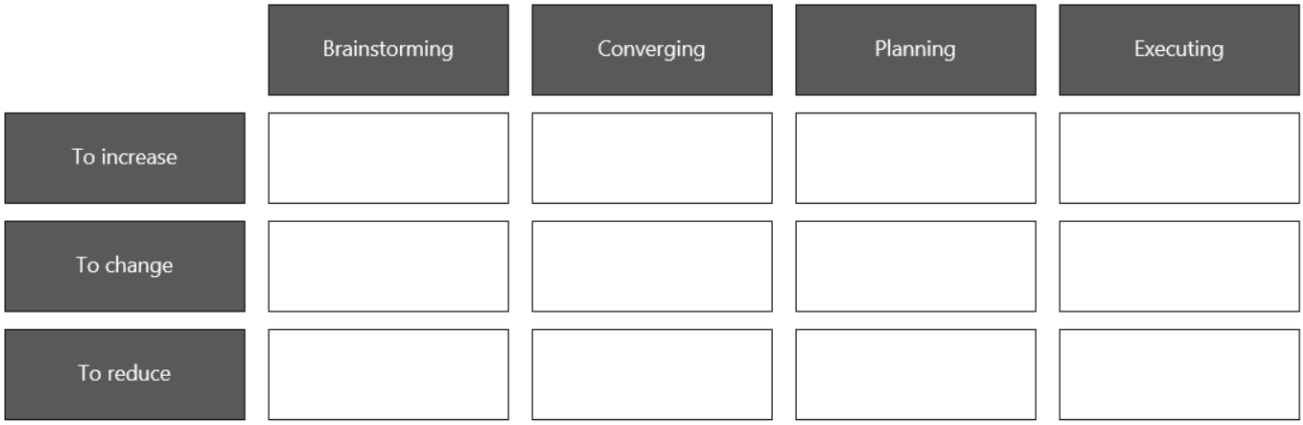


Figure 7 Alignment Matrix: Collaboration Value Level and Collaboration Phases

The following three design requirements are operationalized to identify the phase and the objectives of a partnership.

DR 1. The Relational Calibration Survey must be able to identify the objectives of the collaboration.

DR 2. The Relational Calibration Survey must be able to identify the starting phase of the collaboration.

DR 3. The Relational Calibration Survey must be able to identify all included phases of the collaboration.

The identification of objectives must be addressed, and structured information should lead to a comparable result leading the users of the prototype towards an aligned mindset. The following questions were created to identify in which generic objective and phase a collaboration exists, which will be linked to information transparency in the next chapter.

- Which of the following statements best describes the collaboration in question? The relationship that we are having with our business partner has the aim to […]
  - ☐ increase/change/reduce a business process within our organization;
  - ☐ increase/change/reduce a business process within our partner's organization;

- ☐ increase/change/reduce a business process within both our partner's organization and our organization.

- Which of the following statements best describes the goal of the initiative?
  - ☐ [...] to increase: We aim to develop something innovative, or in other words, to increase or to develop something that has not been done before within the organization (e.g., the development of a new department.)
  - ☐ [...] to change: We aim to improve something already existing; the goal of this initiative is to change something already existing often by improving efficiency. (e.g., restructuring an already existing department to enhance the capabilities to react to a certain business need).
  - ☐ [...] to reduce: We aim to minimize something that already exists; the objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. (e.g., outsourcing capabilities within a certain department to save costs.).

- Which of the following statements describes best in which phase you expect your business partner to start the collaboration?
  - ☐ Brainstorming phase: The problem or challenge is clear, but there is still little insight into what exactly needs to be achieved. We expect our partner to support us to think about the potential objectives of the initiative
  - ☐ Converge phase: The problem or challenge is clear, and there is an insight into what needs to be achieved. We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.
  - ☐ Planning phase: There is an insight into what exactly needs to be achieved, but not yet how it must be executed. We expect our partner to support us in drawing up the plan for achieving these objectives.
  - ☐ Executing phase: There is an insight into what exactly needs to be achieved and a plan on how it must be executed. We expect our partner to help us with the implementation of these objectives.

- Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)? This question concerns the entire cooperation for the specific initiative, so several phases are possible here. (multiple choice)
  - ☐ We expect our partner to support us in thinking about the potential objectives of the initiative.
  - ☐ We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.

- ☐ We expect our partner to support us in drawing up the plan for achieving these objectives.
- ☐ We expect our partner to help us with the implementation of these objectives.

4.3 DECISION 02: OPERATIONALIZATION OF TRANSPARENCY

The design was further operationalized with the theory that transparent behavior is beneficial for the success of a collaboration, a concept mentioned by researchers such as Akkermans et al. (2004), Schnackenberg and Tomlinson (2016), and Koh et al. (2004). To illustrate the concern with the absence of information transparency, scientific literature provided plenty of information about impediments due to inadequate transparency. Table 4 illustrates an outline of the potential outcomes of deficient information transparency.

Outcomes of poor information transparency	**Reference**
Failure to align with the strategic vision of an organization.	Adamala and Cidrin (2011)
The organizational chain is not identified/understood.	Appendix 08
The relevant stakeholders are not identified.	Appendix 08
The intended results are not sufficiently specified.	Appendix 08
The accountability of the partners is unclear.	Bamford et al. (2004)
The responsibilities of the actors are unclear.	Caniëls, Gelderman, and Vermeulen (2012)
The value delivered by information systems is unclear	Dibbern et al. (2004)
The requirements of customers are unclear.	Gelderman et al. (2015)
There are ambiguities regarding the roles and responsibilities.	Kelly et al. (2002); (Strijker-van Asperen et al., 2015)
Unclarity on promises and obligations.	Koh et al. (2004)
Dissimilarities in obligations.	Plane and Green (2012)
Ambiguous understanding of the information requirements.	Schnackenberg and Tomlinson (2016)
Unable to interpret or understand the exact outcomes of a project.	Shaikh and Levina (2019)

Ownership or ineffective allocation is unclear.	Verstegen et al. (2006)
Tender- & contract specificity is unclear.	Wynstra et al. (2018)

Table 4 Outcomes of Poor Information Transparency

However, expressing transparent behavior becomes ambiguous if there is uncertainty about what an organization should be transparent about. That is why the operationalization of transparency is enhanced within the development of the Relational Calibration Survey. Indeed, it seems plausible to discuss what information an organization ought to be transparent about towards their partner.

Schnackenberg and Tomlinson (2016) propose that the construct information transparency consists of information disclosure, clarity, and accuracy. They explain these dimensions of disclosure as the perception that relevant information is received on time, of clarity as to the perceived level of lucidity and comprehensibility of information received from a sender, and of accuracy as the perception that information is correct to the extent conceivable given the relationship between sender and receiver.

Therefore, the Relational Calibration Survey ought to create information transparency on the objectives of a collaboration, which can be related to the need to work towards the same scope definitions and objectives (Plane & Green, 2012).

Indeed, it seems plausible that, when a partnership is founded on different collaboration objectives, obstacles at a later phase of the cooperation can be expected. Failure factors such as a shortage of time and resources spent on the operational and alignment at the beginning of a partnership is also recognized by researchers such as Ali and Khan (2016) and Kelly et al. (2002); thus they advise to invest a considerable amount of time on aligning the operation and relationship at the initial stage of a partnership.

Furthermore, complications such as; failure to align with the strategic vision (Adamala & Cidrin, 2011), dissimilarities in obligations (Plane & Green, 2012), mismatching cooperation objectives (Koh et al., 2004), and poor relational governance controls (Felin & Zenger, 2014) are addressed within the literature as potential problems. Assumingly that information transparency can be stimulated by requesting relevant information in a timely manner by starting to request data about the vision of the objective, identifying mutual obligations and governing mechanisms, and lastly, aligning cooperation objectives.

Requesting information on the objectives of the collaboration is assumed to be straightforward, and the idea was to ask the same questions from both partners to be able to compare the answers. Therefore, it should be probable to expect the answers to be in line with each other since the partners have at least the intention to cooperate. Thus,

if the cooperation objectives do not already match, it seems sensible to discuss the objectives again. As a result, four additional requirements were created for the Relational Calibration Survey to clarify the collaboration further;

DR 4. The Relational Calibration Survey must be able to let the users describe the objectives of the collaboration so that a third party understands them.

DR 5. The Relational Calibration Survey must be able to let the users describe the intended outcomes of the collaboration so that a third party understands them.

DR 6. The Relational Calibration Survey must be able to let the users describe the interdependencies within the collaboration so that a third party understands them.

DR 7. The Relational Calibration Survey must be able to identify the perceived governing structure within the collaboration.

Decision 01 introduced a matrix that clarifies generic objectives and the phases in which the partnership is intended to operate. However, such a matrix is, of course, not enough to determine if the collaboration objective is aligned, and it merely provides information on whether the two partners are overall aligned. The following open-ended questions were created to identify the objectives of the collaboration;

- Could you please describe the overall goal of the collaboration?
- Could you please describe the three most important results that must come out of this collaboration?
- Related to the results that must come out of this collaboration, "Could you please describe the three most important results that must come out of this collaboration?". Could you please provide a time frame in which you expect that the collaboration reaches its result(s)?

Finally, it was assumed that creating a transparent governance structure is additionally imperative to address in a partnership. Indeed, numerous researchers suggest that governance is an essential element of partnerships, and a few of these reasons are addressed below. Generally, some researchers refer to 3 types of governance mechanisms and address elements of an interfirm transactional relationship from the operational, contractual, and relational realm, and this research gave special attention to the operational and relational realm. Oshri et al. (2015) suggest that partnerships aimed at innovation should invest in relational governance, which includes trust-building, communication, and operational transparency. Furthermore, the implementation of governance controls should be considered by both service providers and service recipients (S. Liu, Wang, & Huang, 2017). Nevertheless, there is no one-size-fits-all solution, which is in line with Felin and Zenger (2014), namely, that optimal governance depends on the nature of the problem to be solved.

Therefore, to identify the perceived governing structure within the collaboration. The Relational Calibration Survey aims to cover the identification of governance by consulting all partners on their perception of how collaborations should be governed, and moreover, assesses perceived interdependency and perceived

trustworthiness as relational governance controls. Thus, to identify the perceived governing structure of the collaboration, the following questions were created;

- Could you please describe what needs to be organized to govern these dependencies?
- The assessment of trustworthiness, interpersonal trust, and interdependence (45 statements), of which are 28 statements to assess trustworthiness, interpersonal, and 17 statements for interdependence.

4.4 DECISION 03: OPERATIONALIZATION OF ORGANIZATIONAL TRUST

From the perspective that organizational trust is an essential element of a relational governance mechanism, an important decision had to be made on how to assess organizational trust. The most noteworthy measures of trust seen by McEvily and Tortoriello (2011) were assessed, and the presumed most applicable constructs for a partnership were selected.

McEvily and Tortoriello (2011) have expressed cautiousness when operationalizing trust, and much consideration must be given to the construct of mental models when using qualitative measures to monitor the condition of relationships. The problem with measuring qualitative behaviors with qualitative measures is the question of if the mental representation is close to the structure of the world (Byrne, Segura, Culhane, Tasso, & Berrocal, 2000). However, many researchers have tried to operationalize trust, but to date, there is no golden standard for measuring trust. Consequently, organizations and researchers are still exploring techniques to measure relational governance mechanisms (Martin, 2019).

The constructs seemed not completely inoperable, however, that looking at statistical values will not be very valuable. During the design, the constructs with underlying Likert statements from Mayer and Davis (1999), Currall and Judge (1995), and McAllister (1995) were analyzed. Whereas task coordination and surveillance from Currall and Judge (1995) were considered as unpleasant to request, thus, in the setting in which the prototype compares answers from the actors of two collaborating organizations, the constructs of Currall and Judge (1995) were excluded.

Nevertheless, the choice had to be made on "how can organizational trust be measured." The literature research has found sufficient evidence of the importance of trust, and various researchers made context depending constructs for organizational trust (Seppänen et al., 2007). Therefore, various trust constructs were analyzed and compared to the relational context and generic applicability as criteria to use for the prototype.

#	Research	Relationship category	Analyzed	Evaluated	Selected
1	Aulakh et al. (1996)	Inter-Organizational Relationships	✓	-	-
2	Chow and Holden (1997)	Buyer–Seller Relationships	-	-	-
3	Coote, Forrest, and Tam (2003)	Industrial Marketing Relationships	-	-	-
4	Cummings and Bromiley (1996)	Between Organizational Units	✓	-	-
5	Currall and Judge (1995)	Individuals Across Organizations	✓	✓	-
6	Doney and Cannon (1997)	Buyer–Seller Relationships	-	-	-
7	Dyer and Chu (2000)	Supplier–Automaker Relationships	-	-	-
8	Ganesan (1994)	Retail Buyer and Vendor Relationship	-	-	-
9	Gassenheimer and Manolis (2001)	Buyer–Seller Relationships	-	-	-
10	Gillespie (2003)	Working Relationships	✓	-	-
11	***Mayer and Davis (1999)***	***Working Relationships***	✓	✓	✓
12	***McAllister (1995)***	***Trust in a peer***	✓	✓	✓
13	Mollering (2002)	Buyer–Seller Relationships	-	-	-
14	Nooteboom et al. (1997)	Manufacturer–Supplier Relationships	-	-	-
15	Norman (2002)	Strategic Alliances	✓	-	-

16	Plank et al. (1999)	B-To-B Sales Relationships	-	-	-
17	Sako and Helper (1998)	Supplier–manufacturer relationships	-	-	-
18	Smith and Barclay (1997)	Selling partnerships	-	-	-
19	Young-Ybarra and Wiersema (1999)	Strategic alliances	✓	-	-
20	Zaheer et al. (1998)	Supplier–manufacturer relationships	-	-	-

Table 5 Research and Trust Items Matched

Furthermore, the decision was made to use a fixed response scale known as Likert statements for trust. The primary reason for this is because data analysis remained manageable, results from the stakeholders can be compared directly, and many statements can be presented in a short period. Secondly, because the design already implements various new concepts, adding yet another new factor would require a long additional testing phase of which was little time. However, the decision to use Likert scale statements does have its limitations, and a follow-up to discussion on the reasoning is needed.

That is why the operationalization of trust is performed in three-fold. First, the prototype assessed the diagnostic utilities of a Likert scale by offering 28 statements in which the stakeholders can agree or disagree on a 5-point scale with a neutral middle point. These propositions are constructs that have been created in previous researches to create a mental representation of ability, benevolence, and integrity that allege to represent trustworthiness (Mayer & Davis, 1999) and cognition-based trust and affect-based trust that appeal to represent interpersonal trust (McAllister, 1995). Table 6 presents an overview of these measurement items with corresponding dimensions.

Research	**Measurement instrument**	**Dimensions**
Mayer and Davis (1999)	Organizational Trust	• Ability • Benevolence • Integrity
McAllister (1995)	Managerial Interpersonal Trust	• Cognition-Based • Affect-Based

Table 6 Organizational Trust and Managerial Interpersonal Trust

Organizations are exploring techniques to measure relational governance mechanisms (Martin, 2019), and the application of business rules is a frequently used technique to automate decision-making processes (Hypský & Kreslíková, 2017). Business rules are assumed to be used to identify the "ailment" of the relationship, from the reasoning that, such rules are employed in Business intelligence for example to assess the validity of calculation rules, and during process management to act on specific cases, e.g., *If a user had made a complaint about a product last month, then he has a representative should speak to the user to find out what is going on*. Therefore, it seems appropriate to use business rules when applying a large number of Likert statements, because this seems to create a generalizable, traceable, and timesaving analyzing process. Consequently, business rules were developed, as they have a constructive impact on the analyzing process by creating a chain of evidence and are suitable for saving resources (Hypský & Kreslíková, 2017). The business rules, or as referred to in this research, the flag system is presented in Appendix 04c. The flag system serves to detect negative responses given to the Likert statements in a quick way, whereby the Relational Calibration Survey places a flag next to each statement with a response ranging from "disagree" to "strongly disagree". The results were analyzed by comparing the outcomes of both stakeholders together, interpreted every “flagged” result individually, and concluded discuss each “flagged” statement with the respondents.

As an example the hypothetical case that organization A is neutral on the statement “***our business partner is very capable of performing its job***”, and organization B strongly disagrees on the same statement, something is likely going on, which indicates that both parties do not have much confidence in the ability of each other. Thus, assessing why both actors respond negatively would be valuable.

The last step is to conduct interviews with the users of the prototype. The researcher contacts the users, first individually, then if required together. While the tendency might be to measure, the diagnoses are aimed at improving the relationship. As a result, the three requirements for the prototype were established;

DR 8. Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to diagnose trust-inhibiting behaviors.

DR 9. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to compare these trust-inhibiting behaviors between users.

DR 10. The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of trust-inhibiting behaviors.

4.5 DECISION 04: OPERATIONALIZATION OF INTERDEPENDENCY

Interdependence is often considered as a necessary condition to be able to trust (Rousseau et al., 1998), and is recognized as an essential factor in a partnership (Janssen, 2015; Pirson & Malhotra, 2011; Rousseau et al., 1998). Relationships with high interdependency seem to perform better, are perceived as more reliable, and peers seem to be considered as more trustworthy (McAllister, 1995). It is likely when a collaboration starts, a re-evaluation of processes within the collaborating companies must take place (Verstegen et al., 2006). Thus, by combining business processes, interdependence is created.

The operationalization of interdependence is two-fold. Primarily, the prototype must be able to identify the mutual dependencies within the collaboration. A way to assess if mutual dependencies are transparent is by inquiring information on how both parties assume to depend on each other. Thus, two open-ended questions were created, as illustrated in Figure 8, that could be cross-analyzed after both partners used the prototype. The questions are listed below, and the arrows in Figure 8 illustrate how the dependencies between actor A and actor B are compared.

- Could you please sum-up in what way you are dependent on your partner to realize the objective of the collaboration?
- Could you please sum-up in what way your partner is dependent on you to realize the objective of the collaboration?

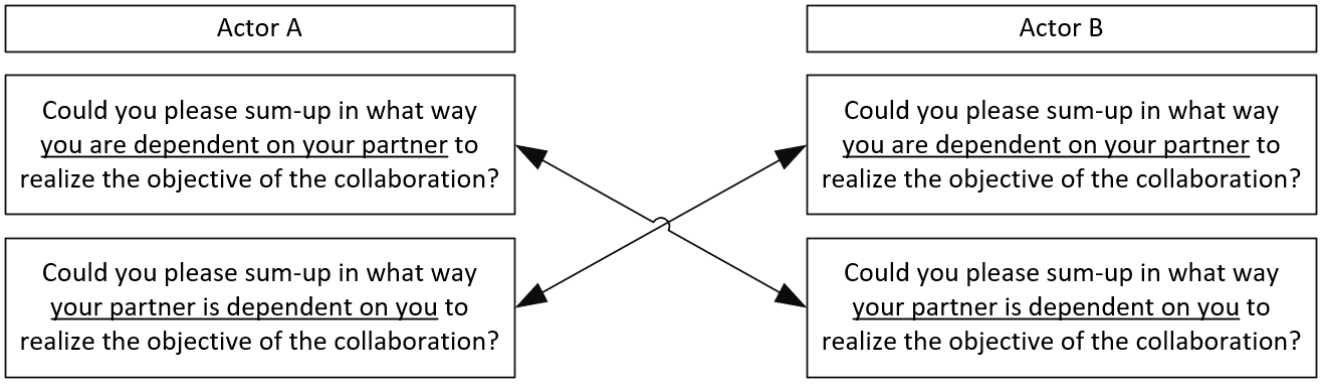


Figure 8 Cross Dependency Assessment by Comparing Actor A with Actor B

Furthermore, the power/dependence constructs were assessed from a survey from Janssen (2015) to diagnose the perceived interdependence between the partners. The constructs “non-coercive power” and “coercive power” originated from Y. Liu et al. (2010), and dependency from Caniëls and Gelderman (2007). The same methodology applied to the operationalization of interdependency as with trust. First, the prototype diagnoses how the respondents feel dependent on each other; then, the researcher compares the results, as presented in Appendix

04c, and finally, the interview starts with the respondents. As a result, four requirements for the prototype were established;

DR 11. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to diagnose interdepending behaviors.

DR 12. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to compare these interdepending behaviors between users.

DR 13. The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of interdepending behaviors.

4.6 Decision 05: Identifying the Users of the Relational Calibration Survey

The design must be targeted towards a specific user group, because it may be that the Relational Calibration Survey would work for one type of user while it would not be suitable for another. This design decision is the first decision made and was relevant to determine the Research Environment.

The aim of the Relational Calibration Survey is that partners can collaborate more efficiently and effectively. Alternatively, in other words, that the partnership is adequate to accomplish a purpose; producing the intended or expected result, and at the same that the partnership is functioning in the best possible manner with the least waste of time and effort.

Determining a cooperation objective is not relevant for everyone, and actors who are going to use the Relational Calibration Survey must have a particular responsibility within managing the cooperation. Furthermore, it can be assumed that the effect of using the Relational Calibration Survey progresses as the relationship progresses, and at the same time the cost of using the Relational Calibration Survey later that if there is a misunderstanding in the collaboration, it will recover probably cost more.

This is in line with the so-called Boehm's law illustrated in Figure 9, who states, the earlier a discrepancy is identified, the smaller the "cost" to solve. When a misalignment happens in the initial stage of collaboration, and this misalignment becomes visible at a later stage of the partnership, the costs of correction are usually significantly higher than if this misalignment was detected earlier on.

Resembling the underlying reason that the activities are not transparent, it is reasonable to assume that the deliverables are also unclear, which signifies that there is also process-based ambiguity at the objective, supply chain, or project level. Rationally uncertainties are more likely to occur when new projects are established, while at the same time as projects often are excluded from daily operations, collaborations are more common.

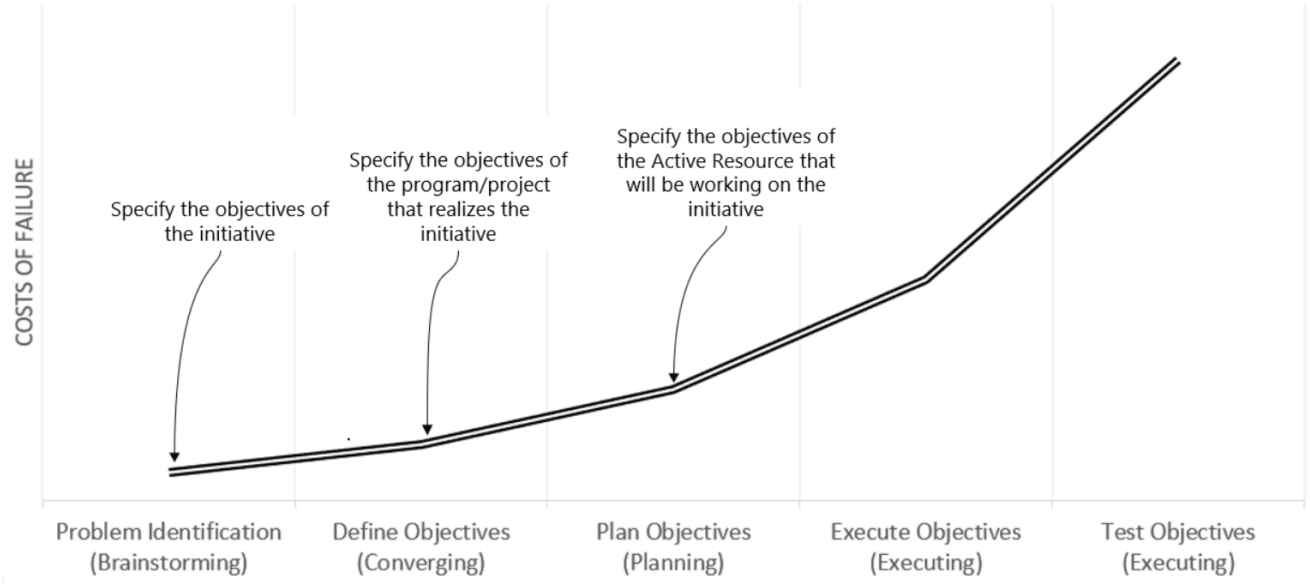


Figure 9 Specification Phases Plotted on Boehm's Law

Consequently, the choice to assess partners that can influence the outcome the most were selected as the user group for this prototype, and the following design requirement was created;

DR 14. The Relational Calibration Survey must be considered practical for actors that are responsible for establishing the collaboration objectives and have the mandate for partnership management.

4.7 DECISION 06: OPERATIONAL REQUIREMENTS OF THE PROTOTYPE

For the prototype to function, various requirements were set for the software in which the prototype had to be designed. The central objective of prototyping the Relational Calibration Survey is to create a survey that helps with the diagnoses of whether the collaboration objectives of both parties are in line with each other, and while doing this, diagnose mutual trust and interdependence.

The operational requirements are not intended to add to the scientific body of knowledge; however, they serve to ensure that the prototype is reproducible for follow-up research.

There are various techniques to retrieve and discuss information such as; procurement forms, questionnaires, and dialogues, to name a few. Nevertheless, when considering that the Relational Calibration Survey should be used without the supervision of the researcher, a method such as an unsupervised survey can be utilized. The following technical requirements have been drawn up for this:

1. The Relational Calibration Survey must have the functional capability to request open-ended questions.
2. The Relational Calibration Survey must have the ability to record questions so that it is possible to analyze and validate the data from the prototype afterward.

3. The Relational Calibration Survey must have the ability to create data that creates comparable results.
4. The Relational Calibration Survey must have the ability to be used without assistance.

4.8 Design Requirements and Prototype Design

In summary, the below list constitutes of several design requirements that the prototype must meet to be considered as accepted. Based on those requirements, a prototype has been developed, which can be viewed in appendix 04.

Requirement 02: Operationalization of the Collaboration Phase and Objectives

DR 1. The Relational Calibration Survey must be able to identify the objectives of the collaboration.

DR 2. The Relational Calibration Survey must be able to identify the starting phase of the collaboration.

DR 3. The Relational Calibration Survey must be able to identify all included phases of the collaboration.

Requirement 03: Operationalization of Transparency

DR 4. The Relational Calibration Survey must be able to let the users describe the objectives of the collaboration so that a third party understands them.

DR 5. The Relational Calibration Survey must be able to let the users describe the intended outcomes of the collaboration so that a third party understands them.

DR 6. The Relational Calibration Survey must be able to able to let the users describe the interdependencies within the collaboration so that a third party understands them.

DR 7. The Relational Calibration Survey must be able to identify the perceived governing structure within the collaboration.

Requirement 04: Operationalization of Organizational Trust

DR 8. Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to diagnose trust-inhibiting behaviors.

DR 9. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to compare these trust-inhibiting behaviors between users.

DR 10. The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of trust-inhibiting behaviors.

Requirement 05: Operationalization of Interdependency

DR 11. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to diagnose interdepending behaviors.

DR 12. Based on the data (output) from the Relational Calibration Survey, the researcher must be able to compare these interdepending behaviors between users.

DR 13. The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of interdepending behaviors.

REQUIREMENT 01: OPERATIONALIZATION OF USERS OF THE PROTOTYPE

DR 14. The Relational Calibration Survey must be considered practical for actors that are responsible for establishing the collaboration objectives and have the mandate for partnership management.

4.9 PROTOTYPE DEVELOPMENT

The name of the prototype is the Relational Calibration Survey; since the emphasis of this research has been placed on the development of a survey-like instrument. The design requirements are derived through design decisions and are meant to operationalize the design objective.

Describing the process, in which the Relational Calibration Survey is presented, makes it clear how the Relational Calibration Survey is used, and although much background thinking has been provided previously, this section summarizes the structure and the components of this version of the prototype. The structure and the components of this version of the prototype are furthermore presented in detail in Appendix 03.

The Relational Calibration Survey pursues to calibrate the operational scope between two parties. To understand how the operational scope, roles, and responsibilities are understood between the collaborating parties, the Relational Calibration Survey has been developed with 15 questions that inquire about the operational scope, interdependencies, a timeframe, and roles and responsibilities from all participating parties.

Furthermore, the Relational Calibration Survey assesses the construct of interdependence and trustworthiness, which are explained in detail in chapter 4.4 Decision 03: Operationalization of Organizational Trust and 4.5 Decision 04: Operationalization of Interdependency.

5 PROTOTYPE EVALUATION

During the prototype evaluation, the Relational Calibration Survey is evaluated based on the design requirements. The design requirements are several propositions or hypotheses against which the design can be examined. These tests can be tested through different practices, and various prototype assessment methods are recommended by Nieveen and Folmer (2013) and Tessmer (1993) to support the reliability of the evaluation results.

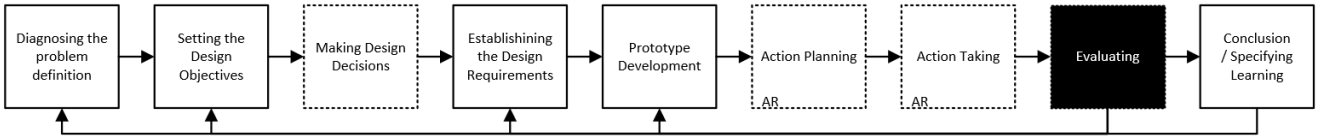


Figure 10 DSR: Prototype Evaluation

The Action Taking process is described in Appendix 03, wherein a process was sketched within a collaboration in which both the service provider and service recipient have completed the Relational Calibration Survey, as presented in Appendix 04. Then, a feedback survey was sent to all participating parties within the research environment, as presented in Appendix 05. Subsequently, the researcher analyzed the results of the Relational Calibration Survey. Finally, the analyzed results were discussed in an interview with the service provider[2]; the transcript of the discussion is presented in Appendix 07b.

5.1 METHOD OF EVALUATION

Based on the action taking process, as presented in Appendix 03, it has been assessed whether the Relational Calibration Survey meets the design requirements. A strategy of testing is to hypothesize whether the Relational Calibration Survey has met the predetermined requirements. Subsequently, a method of evaluation was established for testing whether the Relational Calibration Survey had met those hypotheses.

The design requirements consist of the evaluation of open questions, multiple-choice questions, and Likert statements. Several design requirements were evaluated through data analyses alone, while other design requirements could best be analyzed through an interview afterward to measure the user experiences.

Design Requirement	**Method of Evaluation**
DR 1-3	Design requirements 1-3 should provide insights into the generic collaboration objectives and phases in which the partnership will exist. They were analyzed by assessing the input for the developed matrix in Appendix 08b. The aim is to evaluate whether the matrix could provide a meaningful visualization based on the information from the Relational Calibration Survey, or in other words, to communicate the relationship among the represented data to viewers of the matrix. This evaluation was done by 1) plotting the data from the Relational Calibration Survey on the matrix as illustrated in Appendix 08b, and 2)

[2] The participating actor of the service receiving party did not participate in the discussion of the results.

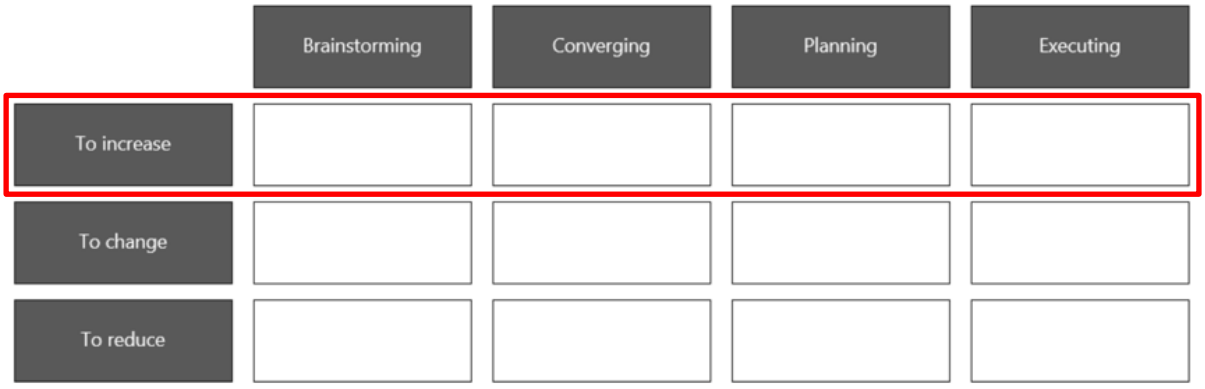
	during the interview (Appendix 07b) verifying whether both users of the Relational Calibration Survey could agree with the generic collaboration objectives and phases in which the partnership will exist.
DR 4-7	Design requirements 4-7 were assessed by evaluating their interpretability of a third party. The questions that were asked in the Relational Calibration Survey related to collaboration objectives, results, interdependencies, and the governance of these dependencies and were asked in the form of open-ended queries. To determine whether these queries were answered as intended; The questions were evaluated by examining the data (answers) extracted from the Relational Calibration Survey, and secondly, by verifying the given answers through an interview with the actors that used the Relational Calibration Survey with the emphasis on determining whether the researcher understood what the objectives were based on the information provided.
DR 8 and 11	Design requirements 8 (trust) and 11 (interdependence) were all evaluated by studying the produced data from the Relational Calibration Survey. The methodology that the researcher used to diagnose the results was as follows; for each statement, a "rule" was applied which standard was set as "*IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner then a diagnostic flag will arise.*", and negative statements where reversed coded. Appendix 04d provides a list of rules, and This content is not available in this public version Table 17 and Table 18 in appendix 07c illustrate the results, each result is marked with the related design requirement.
DR 9 and 12	Design requirements 9 (trustworthiness) and 12 (interdependence) were also evaluated by comparing the produced data from both actors through the use of the Relational Calibration Survey. The applied rule was that when both parties had a difference in a score that exceeded 1 point, a flag is provided. This content is not available in this public version Table 17 and Table 18 in appendix 07c provide the results, and each result is marked with the related design requirement.
DR 10 and 13	Design requirements 10 (trustworthiness) and 13 (interdependence) are about getting a clear understanding of the underlying thoughts that participants have about the Likert propositions of trustworthiness and interdependence towards each other. These Design requirements were evaluated through a discussion between the researcher and the participants within the research environment. Design requirements 10 (trustworthiness) and 13 (interdependence) were only possible to evaluate after design requirements 8, 9, 11, and 12 had been executed because the evaluation of design requirements 10 and 13 are based on the results from the analysis performed in Appendix 07c.

DR 14	Design requirement 14 evaluates the usability of the Relational Calibration Survey in general. This evaluation was conducted through an interview with all actors within the research environment. This interview can be read back in Appendix 07b and had the central question; "How useful is the Relational Calibration?"
DR 15-18	Design requirements 15, 16, 17, and 18 were tested by completing the Relational Calibration Survey itself, which could be an analogy with a system test in software development. These tests were significant for research in selecting the right instrument, however, primarily practical, and would aid in replicating the Relational Calibration Survey. That is why these requirements have been brought to Appendix 09, as they were set as a prerequisite for the following design requirements.

Figure 11 Method of Evaluation

5.2 DESIGN REQUIREMENTS EVALUATION

This research has selected 18 design requirements for evaluation, and a combination of evaluation methods has been used to assess these 18 design requirements, as presented in 5.1 Method of Evaluation. First, the prototype was evaluated through observations. Second, several requirements were evaluated by the produced output from the Relational Calibration Survey. Specific design requirements were, when feasible, further evaluated within the research environment through a discussion, as presented in Appendix 07b. Finally, an evaluation survey was employed to create an understanding of the perceived practicability of the Relational Calibration Survey. Table 7 presents a representation for each design requirement with the test hypothesis and a brief description of the method of evaluation to determine the result of the test hypothesis.

#	Results
DR 1.	The Relational Calibration Survey must be able to identify the objectives of the collaboration. ***Conclusion*** The Relational Calibration Survey somewhat identifies the objectives of the collaboration. The objectives of the collaboration were recognized as matching by all parties in the research environment; this could be analyzed because the objectives of the collaboration were requested through close-ended questions. To illustrate the results, the collected results from the Relational Calibration Survey are plotted on the proposed matrix in Figure 7 of chapter 4.2. On the first question "Which of the following statements best describes the goal of the initiative?", both users of the Relational Calibration Survey stated, "[...]to increase: We aim to develop something innovative, or in other words to increase or to develop something that has not been done before within the organization (e.g., the development of a new department.)". Thus, based on the results, the vertical layer of the matrix was filled in.  Figure 12 The Objectives of the Collaboration Plotted on the Matrix However, while the same answer was given, within the feedback round about the practicability of the Relational Calibration Survey, the users only showed moderate satisfaction, because the perception was that the Relational Calibration Survey did not specify enough whether the prototype refers to a particular (part of) a project or the complete collaboration.

DR 2.

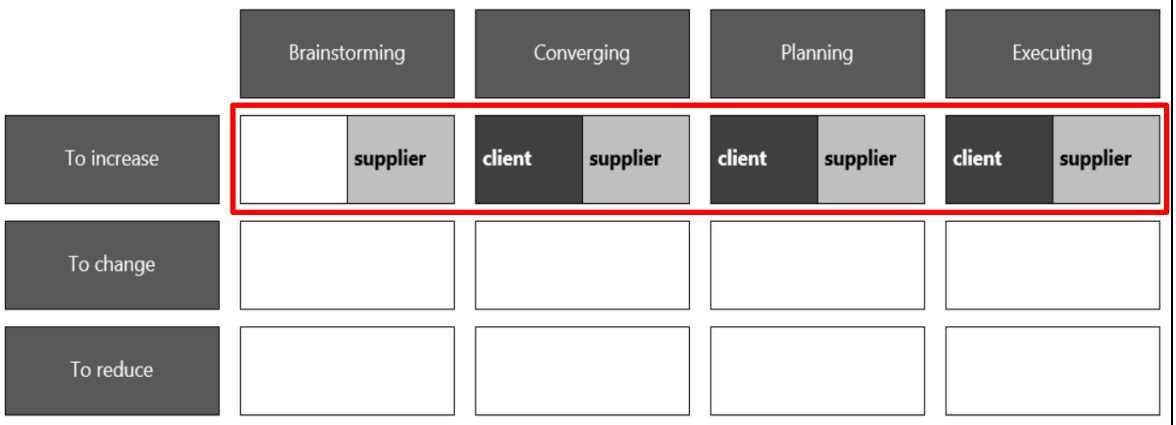
The Relational Calibration Survey must be able to identify the starting phase of the collaboration.

Conclusion

The Relational Calibration Survey somewhat identifies the starting phase of the collaboration. Based on the observed data, as presented in Appendix 07b, the Relational Calibration Survey identifies the starting phase of the collaboration, as illustrated in Figure 13.

Figure 13 The Starting Phase of the Collaboration Plotted on the Matrix

Both respondents did give the same results on the question, “Which of the following statements describes best in which phase you expect your business partner to start the collaboration?” However, during the discussion, it became apparent that there was ambiguity about whether the starting phase of the collaboration was between the participants or the partnering organizations.

DR 3.	The Relational Calibration Survey must be able to identify all included phases of the collaboration. ***Conclusion*** The Relational Calibration Survey does not identify all included phases of the collaboration. Based on the observed data from the question "which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)?" the Relational Calibration Survey identified a discrepancy between the two parties in all included phases of the collaboration, as illustrated in Figure 14.  Figure 14 All Perceived Phases of the Collaboration Plotted on the Matrix However, because not all users of the Relational Calibration Survey were present during the discussion of the usability of the prototype, it could not be identified why a discrepancy was identified in the phases of the collaboration, and therefore it cannot be concluded whether the Relational Calibration Survey identifies all included phases of the collaboration.

DR 4.	The Relational Calibration Survey must be able to let the users describe the objectives of the collaboration so that a third party understands them. ***Conclusion*** The researcher had little prior insight into the objectives of the collaboration of the research environment and took the stance that the Relational Calibration Survey should provide that insight to be considered successful. The Relational Calibration Survey ought to describe the objective of a partnership, and this description should also be comprehensible for other actors, such as employees within the procurement department. Thus, the Relational Calibration Survey is being evaluated through the test, whether the researcher understood the results. The researcher analyzed the answers given by the users of the Relational Calibration Survey to the question "Could you please describe the overall goal of the collaboration?", and confirmed his understanding of the provided answers with the users of the Relational Calibration Survey in a discussion afterward. However, interpreting these results turned out to be complicated because the users of the prototype used abbreviations and keywords. Therefore, the Relational Calibration Survey does not let the users describe the objectives of the collaboration that can be understood easily by a third party.
DR 5.	The Relational Calibration Survey must be able to let the users describe the intended outcomes of the collaboration so that a third party understands them. ***Conclusion*** The prototype lets users describe the intended outcomes of the collaboration. Which was assessed through the analyzes of the results of the question, "Could you please describe the three most important results that must come out of this collaboration?". However, with the same given reasoning of DR 4, the prototype does not let users describe the intended outcomes of the collaboration.
DR 6.	The Relational Calibration Survey must be able to able to let the users describe the interdependencies within the collaboration so that a third party understands them. ***Conclusion*** Unlike DR 4 and DR 5, the prototype lets users describe the interdependencies within the collaboration so that a third party understands them, and while the questions to identify the goals and deliverables of the collaboration in keywords that were hard to understand by the third party, the questions "Could you please sum-up in what way you are dependent on your partner to realize the objective of the collaboration?" and "Could you please sum-up in what way your partner is dependent on you to realize the objective of the collaboration?" gave the researcher a good understanding of the responsibilities. Thus, it was possible to understand whether the expectations of both respondents were in a line which each-other, and the Relational Calibration Survey lets users describe the interdependencies within the collaboration so that a third party understands them.

DR 7.	The Relational Calibration Survey must be able to identify the perceived governing structure within the collaboration so that a third party understands them. ***Conclusion*** The Relational Calibration Survey does not identify the perceived governing structure within the collaboration. To analyze whether the Relational Calibration Survey was able to identify the perceived governing structure within the collaboration, the results of the question "Could you please describe what needs to be organized to govern these dependencies?" were analyzed. The results delivered some general ideas on how to govern the collaboration. However, it was challenging to find a structure, so it cannot be said, purely based on the data, a third party has a clear understanding of how the partnership will be governed after reading the results of the Relational Calibration Survey.
DR 8 & 11	DR 8: Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to diagnose trust-inhibiting behaviors. DR 11: Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to diagnose interdepending behaviors. ***Conclusion*** Through the Relational Calibration Survey results, the researcher (or a third party) had the information that could enable him/her to diagnose trust-inhibiting but not of interdepending behaviors. The trust-inhibiting behaviors come from existing studies from Mayer and Davis (1999) and McAllister (1995) and have been applied unadjusted while the measurement of interdepending behaviors was used from Caniëls and Gelderman (2007) and Y. Liu et al. (2010). While using the Relational Calibration Survey, the data was analyzed, and it was concluded that the flag system works. The calculation rule for the flag system is = IF ("statement"> = neutral (3), "", "FLAG"), and this rule can be adjusted per statement, allowing the researcher to indicate conditionally what is acceptable per rule. Nevertheless, the construct of "coercive power" of Y. Liu et al. (2010) used double-barreled phrasing of the statement, making it ineffective to analyze further. Therefore, the prototype could not rely on the developed flagging system, and design requirement 11 should be redeveloped.

DR 9. & 12	DR 9: Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to compare these trust-inhibiting behaviors between users. DR 12: Based on the data (output) from the Relational Calibration Survey, the flagging system developed must be able to compare these interdepending behaviors between users. ***Conclusion*** Through the prototype results, the "flagging system" was able to compare trust-inhibiting and interdepending behaviors between users. The formula used was =IF (ABS ("STATEMENT 1 ACTOR 1"- "STATEMENT 2 ACTOR 2")>1,"FLAG"," "). Appendix 07c This content is not available in this public version Table 17 & Table 18 presents the results. Even that, the construct of non-coercive power could not be flagged because of double-barreled phrasing, and a comparison could be made for discussion.
DR 10 & 13	DR 10: The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of trust-inhibiting behaviors. DR 13: The Relational Calibration Survey must be able to provide an output that can be used to conduct an interview based on the given results of interdepending behaviors. ***Conclusion*** Through the prototype results, the researcher was able to conduct an interview based on the given results of trust-inhibiting behaviors and interdepending behaviors. Based on the results of the Relational Calibration Survey, as presented in the flagging system, users of the Relational Calibration Survey could be asked what their arguments were for answering a specific statement. The researcher, therefore, argues that it is this step that provides essential information for the calibration of a partnership. Because by looking further than analyzing flags, ranks, and counts, the discussion after the Relational Calibration Survey provided insights on attitudes, feelings, and behaviors.

DR 14.	The Relational Calibration Survey must be considered practical for actors that are responsible for establishing the collaboration objectives and have the mandate for partnership management. ***Conclusion*** The Relational Calibration Survey is considered moderately practical for the users. The assessment of this test was done by asking the users a few questions about the practicability of the prototype. However, the participants within the research environment had some concerns with several aspects of the Relational Calibration Survey, which will be summed up; It was unclear to some participants whether it was about the role of the person that filled in the Relational Calibration Survey or the collaboration. It was unclear to some participants whether some questions were addressed from a service provider or a service recipient perspective. Thus, some questions asked in the prototype required a better clarification of the actors. It was unclear to some participants how the statements of non-coercive power should be read. For example, the statement "This partner did what we anticipated because we had largely similar business philosophies.", brought ambiguity, because a partner can do what was anticipated without having similar business philosophies. One of the participants emphasized that the use of the prototype would be relevant at the start of a partnership and that the prototype should assess the collaboration in sequences over time. The participants mentioned that sharing information about feelings towards each other can be sensitive, and therefore, they opted for a strict protocol on how to use the data from the Relational Calibration Survey. Perhaps even with an independent mediating person to analyze the results.

Table 7 Prototype Requirement Evaluation

6 DISCUSSION, LIMITATIONS, CONCLUSION & RECOMMENDATION

This chapter concludes the findings presented in the previous chapters and elaborates on the research questions, design objective, and design requirements, as well as concluding the findings of the research environment provided in the evaluation of the Relational Calibration Survey. The conclusion of the literature research served as the foundation of those arguments and can be found in 2.2 Conclusion of the Literature Research.

6.1 DISCUSSION

As a part of a master thesis, this research completed a full design cycle, as illustrated in Figure 15. A full design cycle starts with the diagnosis and concludes with a contribution based on the assessment of the prototype evaluation.

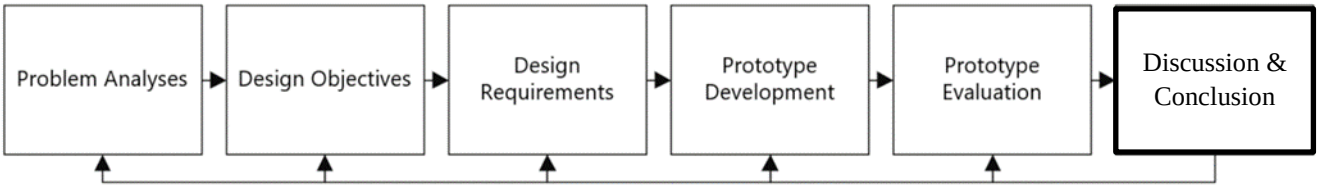


Figure 15 DSR: An illustration of a Full Design Cycle

However, a design cycle is not a linear process, which is illustrated with feedback arrows, as emphasized in Figure 16, and a discussion about the events this research proceeded through during the course of the design of the Relational Calibration Survey is relevant.

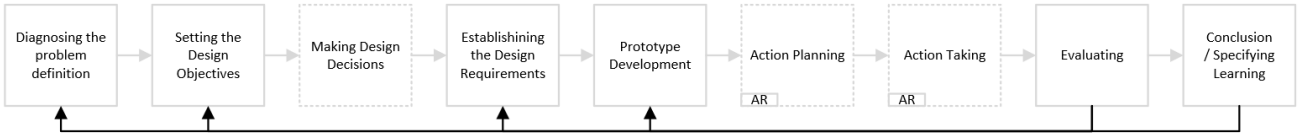


Figure 16 The Feedback Arrows of a Design

This chapter discusses the insights found throughout the design process, and consequently, some of the design requirements proved to be valuable in this research. However, other design requirements should additionally be revised in a subsequent design cycle.

The findings indicate that the developed matrix, as presented in chapter 4.2, only somewhat identifies the objectives and the starting phase of the collaboration. This became evident through the assessment of design requirement evaluation 01 and 02 in chapter 5.2. Throughout the conversation with the test-subjects, it became apparent that there was ambiguity with at least one of the test subjects of the research environment about whether the starting phase and the objective of the collaboration were between the participants (on an interpersonal level), ***or*** the partnering organizations (on an organizational level). Indeed, the suggestion is that the Relational Calibration Survey should more clearly specify the "partner."

Furthermore, the analyzed data from the Relational Calibration Survey did not provide enough information to conclude whether the Relational Calibration Survey was able to include all phases of the collaboration, which was assessed through design requirement evaluation 03. From the data extracted from the Relational Calibration Survey, it could be traced that the starting phase of the partnership with one of the test subjects started during the

brainstorming phase; however, when the Relational Calibration Survey subsequently asked to indicate all phases, the brainstorming phase was omitted. The test subject who gave this answer in the Relational Calibration Survey was not present in the discussion after the Relational Calibration Survey was used. Thus, it remains speculative why there was a difference in these two answers.

Only one out of four of the open-ended questions asked in the Relational Calibration Survey became understandable for the researcher without an additional explanation provided by the test subjects within the research environment. The objectives of the collaboration, the intended outcomes of the collaboration, and the perceived governing structure within the collaboration, all needed a dialogue afterward to make them understandable for the researcher.

Not all design requirements based on the evaluation of open-ended questions were rejected, as the researcher understood the described interdependencies of design requirement 06 within the collaboration without a conversation with the users of the Relational Calibration Survey afterward. When searching for an explanation for this conclusion by observing the questions and answers, it seems plausible that design requirement 06 was accepted because interdependencies can assumingly be described more generically as organization related objectives, such as design requirements 04, 05, and 07.

There is an operational need to further specify design requirements 04, 05 and 07, as the theorized problems such as different expectations (Koh et al., 2004), mismatching definitions and objectives (Plane & Green, 2012), and incomplete contracts (Gelderman et al., 2015; Lane & Lum, 2011; Verstegen et al., 2006) stay a concern in partnerships, and this first attempt to create clarity on the objectives did not deliver a complete solution for the problem. It seems that through the use of the Relational Calibration Survey, the collaboration objectives, the interdependencies, and the perceived governing structure within the collaboration were confirmative; thus, the test-subjects agreed that they had the same collaboration objectives. However, the same conclusion did not occur for a third party, such as the researcher in this matter. Therefore, the problem, as presented in chapter 1.2 Problem Statement, is not yet resolved. Thus, the question remains; “Can an instrument, such as the Relational Calibration Survey, ensure that the collaboration objective, governance structure, and interdependencies are adequately identified, or is an instrument, such as this Survey, useful as a conversation starter?”

Returning to the discussion regarding the usability of the Relational Calibration Survey, through the assessment of design requirements, researchers such as Seppänen et al. (2007) and Caniëls and Gelderman (2007) perceive mutual trust and interdependence as a critical factor in defining whether a partnership can be successful. Consequently, the Relational Calibration Survey evaluated perceived trust-inhibiting and interdepending behaviors through design requirements 08 to 13. The researcher obtained both trust-inhibiting and interdepending behaviors through the 45 Likert statements presented in the Relational Calibration Survey; however, the construct

of Non-Coercive Power of Y. Liu et al. (2010) used double-barreled statements, and therefore, no assumption could be made whether the “flagging system” was able to diagnose, as presented in design requirement 11, interdepending behaviors, as presented in design requirement 12. A double-barreled statement cannot be accurately compared to its content, and it would be sensible to alter the Non-Coercive Power construct by Y. Liu et al. (2010) or even completely replace it within the Relational Calibration Survey for another construct that measures interdependence in a similar matter.

However, it is possible to assess the mechanism of business rules. Through the Relational Calibration Survey results, the “flagging system” was able to compare trust-inhibiting and interdepending behaviors between users. The flag system, as presented in Appendix 04b, was inspired by the principle of business rules, whereby a position is taken in which a business rule defines each Likert statement as always resolving to either true or false. The flag system proved useful for the analysis, and for convenience. The following business rule has been applied to every Likert statement: “IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, THEN a diagnostic flag will arise.”. Nevertheless, to give meaning to the result of perceived interdependence and trustworthiness, the researcher considered it necessary to conduct an interview based on the given results of trust-inhibiting behaviors and interdepending behaviors.

The usefulness of the flag system was that 45 statements could not all be discussed with the users of the Relational Calibration Survey in a short time. However, by using this system, the researcher was able to conduct an interview based on a subset of the given results of trust-inhibiting and interdepending behaviors.

The interview with the test subjects about perceived mutual trust, however, revealed itself more relevant than anticipated. For example, it emerged from the conversation that the perceived interpersonal trust towards the partnering test subject was recognized as more favorable than the perceived trustworthiness towards the partnering test organization. This observation could also be identified in retrospect through the analyzes of the data from the Relational Calibration Survey. The results of the Relational Calibration Survey presented that one of the test subjects in perceived trustworthiness reacted predominantly positive to constructive statements with the answer "Agree," while "Strongly Agree" was used more frequently in interpersonal trust. This indication was not captured by the set business rules, and although much can be captured with business rules, the underlying information can only be traced through conversations and observations.

Referring to design requirement 14, the Relational Calibration Survey is considered moderately practical for the users. The limitations of the Relational Calibration Survey should be 1) adjusted in the Relational Calibration Survey, and 2) feedback from the users of the prototype has also let to suggestions about the timeframe when the Relational Calibration Survey should be used.

Firstly, it is reasonable to assume that the use of the Relational Calibration Survey would be most advantageous at the beginning of a relationship, as this phase is often characterized by ambiguities, in which the Relational Calibration Survey could facilitate to create clarity. This is further fueled by the fact that Kelly et al. (2002) and Ali and Khan (2016) emphasize that trust-building is essential from the moment a relationship starts, and various researchers consider information transparency as an initiating mechanism of perceived trustworthiness.

Secondly, the Relational Calibration Survey could be used multiple times during a collaboration, since objectives could change, and contracts are frequently incomplete at the beginning of a collaboration. Thus, periodically assessing the collaboration objectives could not only be used as interim reconciliation tools, but the results may also serve as input for amending the contracts periodically, which is in line with the suggestion provided by Gelderman et al. (2015) to periodically reassess the contract during the collaboration since specifications may change.

Moreover, the Relational Calibration Survey needs to work in combination with, for example, a stakeholder dialogue, as the results are given within the Relational Calibration Survey often required further clarification. Perhaps, stakeholder dialogue, as suggested by Kaptein and Van Tulder (2003), could be used as a follow up of which the Relational Calibration Survey could account for the principal basis.

Figure 17 visualizes de design cycle to discuss where future research should begin. During this research, no evidence was found that the diagnosed problem statement was untrue. However, as with any first iteration, the prototype could benefit from improvements to its design requirements. Multiple design requirements need to be revised. Design requirements 03, 04, 05 & 07 need a proper reassessment, and design requirements 01, 02, and 14 could use some minor improvements. Lastly, several design requirements worked as intended, and design requirements 06, 08, 09, 10, 11, 12, and 13 could serve as the basis for a subsequent iteration.

Therefore, as Figure 17 illustrates, it would be sensible to begin with the revision of the design objective, as it provides the foundation of the established design requirements.

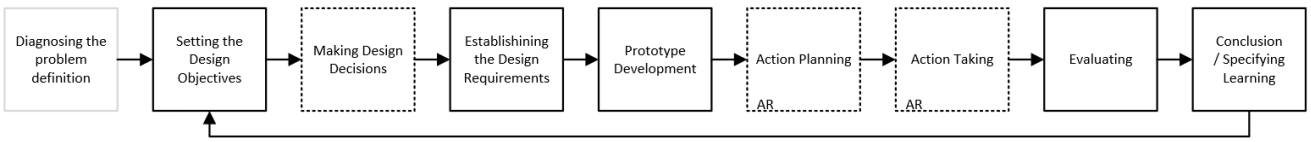


Figure 17 DSR: Evaluation of the Feedback Arrows

To conclude, the Relational Calibration Survey aims to identify mutual obligations, interdependencies, and potential governance mechanisms, which assumingly could be the missing input in the often-complex setup of purchasing contracts. The Relational Calibration Survey is at an infant stage in which there is a demand to assess the Relational Calibration Survey on various collaborations. Nevertheless, the identification of mutual obligations,

interdependencies, and potential governance mechanisms is only possible if the actors have considerable knowledge of the objectives of the collaboration.

6.2 LIMITATIONS & RECOMMENDATIONS

Before the conclusion to this research is presented, 6.2.1 Limitations and 6.2.2 Recommendations discuss the limitations of this research during the development and evaluation of the Relational Calibration Survey and the recommendations for follow-up research.

6.2.1 Limitations

This chapter contains the limitations of this research and recommendations for future studies. The same as already introduced in 6.1 Discussion, this research went through a full design cycle. However, during this research, individual design choices could not always be adjusted, even though new insights provided a different view of the solution, which implies that design requirements 03, 04, 05, 07, 11, 12, and 13 were rejected, and design requirements 01, 02, 06, 08, 09, 10, and 14 were not rejected. However, design requirements 01, 02, and 14 required some adjustments, as presented in chapter 5.2 Design Requirements Evaluation.

The operation of the Relational Calibration Survey was examined within one research environment, and the results, as discussed in 5.2 Design Requirements Evaluation, were, therefore, only evaluated by a small group of individuals. However, the operation of the Relational Calibration Survey should ideally be examined throughout multiple research environments to verify whether the received findings are universal.

Furthermore, the Relational Calibration Survey was implemented in a research environment that was in an advanced stage of the collaboration. Thus, the objectives and responsibilities of both test subjects were most likely mutually recognized at an earlier stage. Therefore, it remains speculative how the Relational Calibration Survey would perform during the initiation phase of a partnership since this has not been explicitly examined.

The multidimensionality of characteristics defining relational constructs is challenging (Pa & Tapsir, 2013), and the mental models that were assessed with Likert constructs may benefit from different assessment mechanisms, depending on the time of collaboration that it is assessed. Indeed, most of the constructs studied measure a specific type of behavior, but the question is whether these statements are a reflection of trustworthiness or interdependence. What became evident is that most of the constructs studied measure a specific type of collaboration, making generalizability difficult. In this research, it became noticeable that “Non-Coercive Power” of Y. Liu et al. (2010), for example, uses double-barreled statements, which is undoubtedly a limitation for the current version of the Relational Calibration Survey.

Moreover, it is essential to refer to the quantification of mutually perceived trustworthiness and interdependence in the Relational Calibration Survey, since it is crucial to mention again that the complexity of measuring qualitative behaviors and mental models can be perceived differently based on personal experiences (Jones et al., 2011), cultures (Thumrungroje, 2013), and even assumingly by some extend the mood of a person, and therefore the user of the Relational Calibration Survey must take into account that these constructs require to be interpreted with some caution. Likewise, existing constructs are often context-dependent, and therefore each researcher should consider which trust construct fits the partnership best.

The Relational Calibration Survey applies business rules to analyze each Likert statement, while the application of business rules is a proven technique in process management (Hypský & Kreslíková, 2017). No evidence was found that metal models of trust and interdependence were measured through the assessment of business rules, whereby further validation of the methodology ought to be performed.

Lastly, this research provided a method on how business rules can be calibrated, assuming that the created business rules were valid. However, during the development of the Relational Calibration Survey, the researcher did not create a procedure on how a business rule could be generated, managed, and evaluated.

6.2.2 Recommendations

The Relational Calibration Survey was troubled by the lack of conditional statements, which suggests that a new iteration is beneficial to look at the Relational Calibration Survey from a programmer's perspective.

Moreover, while substantial attention has been given to the construction of the Relational Calibration Survey, it became apparent that the Relational Calibration Survey as a stand-alone solution would not be beneficial, and a recommendation is to combine the Relational Calibration Survey with a discussion following this Survey. Indeed, the Relational Calibration Survey seems to provide input for the dialogue. However, complicated objectives such as collaboration objectives may not be resolved with the Relational Calibration Survey alone, and one may have to ask, "Are there any ways to discuss collaboration objectives without the use of a conversation?"

The evaluation of the Relational Calibration Survey will benefit when it is researched in different circumstances. Consequently, the findings become more generalizable, which in turn will benefit the external validity of the results. For a follow-up research it is, therefore, worthwhile to consider case-control research in which a group uses the Relational Calibration Survey at the start of the collaboration versus a group that does not, and after a certain period of time, the satisfaction with the collaboration is being measured.

Furthermore, attention must be given to the conditional formulation of questions in the Relational Calibration Survey. Conditional formulation of questions was not determined as a design requirement of the Relational Calibration Survey; however, such properties are relevant for the extraction of the information.

In addition, the formulation of open-ended questions will have to be considered because they are challenging to analyze. The Relational Calibration Survey has been able to retrieve much information, a combination of closed and open-ended questions; however, a dialogue with users remains relevant to give context to the calibration.

Lastly, future researchers could concentrate on finetuning the process around the Relational Calibration Survey or reassessing the design requirements; as creating a process will likely increase the knowledge about how the Relational Calibration Survey can best be used while improving the design requirements will ensure that a better specification of the prototype is created.

6.3 CONCLUSION

In this research, a prototype of a Relational Calibration Survey that assesses the mutual collaboration objectives in a partnership and evaluates perceived mutual trustworthiness was created through Design Science Research. The literature research illustrated that interdependencies, a clear understanding of the collaboration objectives, and mutually perceived trustworthiness, is imperative in partnerships. Likewise, being transparent is a trust initiator, and partnerships are frequently more efficient when both partners depend on each other. Additionally, the presence of governance mechanisms is considered necessary for a partnership.

As an entire design cycle has been completed, the status of the Relational Calibration Survey can be concluded. The Relational Calibration Survey was designed to identify mutual obligations and assesses perceived mutual trustworthiness within a partnership, and it was created to generate transparency between partners and helps to provide clarity on fundamentals such as collaboration objectives and dependencies, which are in currently existing procurement processes often challenging to identify.

The Relational Calibration Survey was built on academic literature and validated on practical relevance within its research environment. The results of the workability of the prototype were evaluated through the examination of the design requirements. As with many first attempts, some design requirements were operational, and some design requirements need to be further refined.

The Relational Calibration Survey facilitates in the creation of transparency in mutually perceived obligations and interdependencies, and compares mutually perceived trustworthiness and interdependence among the partnership through the application of a combination of Likert statements and business rules. The Relational Calibration Survey has been evaluated by being used on two organizations that are striving to create a data infrastructure with innovative data applications for one of the two partners. After examining the design requirements of the Relational Calibration Survey, several conclusions could be made.

The Relational Calibration Survey provides an initial shift towards a systematic method of requesting cooperation objectives and interdependencies, as it aids in identifying the collaboration objectives, interdependencies, and phasing of the collaboration. However, the identification of interdependencies, the collaboration objectives, and the governance mechanism will benefit when follow-up research starts by examining the design of the Relational Calibration Survey. Thus, it gives the impression that improving the design requirements, in particular, will yield a great deal in the further operationalization of the prototype.

The Relational Calibration does not yet have the status of a completed creation and has only been assessed on one particular research environment. The design objective was to create a survey that requests the goals, dependencies and the relational health of the collaboration, in such a way that a mediating party can compare the relational objectives and facilitate in the alignment of interests, stakes, and commitment of the actors that have followed the presented Relational Calibration Survey.

After, the evaluation of the Relational Calibration Survey, the prototype appears to be appropriate to be used as an inventory tool of a partnership; however, the Relational Calibration Survey can at this time only be used as instrument that grants input for a dialogue in which the collaboration objectives are discussed, and any complications in a collaboration are identified to be solved through that same dialogue.

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APPENDICES

APPENDIX 01: LITERATURE RESEARCH

The literature research consists of five sections. First, the essence and success factors are addressed within partnerships. Secondly, trust and the relevance of having organizational trust is examined. Thirdly, the development of organizational-trust is investigated, and subsequently, various constructs for organizational-trust were reviewed, and lastly, a conclusion of the literature research is illustrated.

Organizational partnerships

A certain level of dependency characterizes a lot about a partnership; an organization may need the service from the other party (dependent) or can be considered as "extra" or “replaceable” (independent) (Kiewiet-Kester, 2008). Every collaboration requires good organization (Kaats et al., 2005). Thus, coordination between the parties involved must take place at both policy and practical level (Kiewiet-Kester, 2008). Furthermore, a partnership consists of mutual obligations in a contractual relationship (Koh et al., 2004).

Successful organizational partnerships within the Business Intelligence sector should consist of the right amount of project funding, business value, and the alignment of the project to a strategic vision for Business Intelligence (Adamala & Cidrin, 2011). Table 7 presents eight dimensions of outsourcing success derived from Schwarz (2014) that practitioners and academics agree on the top criteria for outsourcing success, the dimensions are meant for IT outsourcing but seem to be somewhat universal, thus, perhaps also applicable to business intelligence.

Eight dimensions of outsourcing success	**Literature**
1. The partner acquires additional capabilities	(Schwarz, 2014)
2. Objectives are achieved on time	
3. The partner receives financial benefits	
4. Quality is improved	
5. The arrangement allows for flexibility to accommodate changing circumstances/needs	
6. The partners develop a mutually beneficial relationship	
7. Mutual satisfaction is achieved	

8. SLAs (service-level agreements) are met or exceeded	

Table 8 Dimensions of Outsourcing Success by Schwarz (2014)

Decision-making is also an essential component of organizational partnerships, and how it takes place states a lot about collaborations. For example, there may be direct decision-making, delegation, or the use of intermediaries (Kiewiet-Kester, 2008).

Typically, organizational partnerships also use formally recorded agreements or contracts. These formally recorded agreements can be described as institutional arrangements covering solutions to potential problems (Verstegen et al., 2006). However, contracts may never fully cover the organizational agreements (Gelderman et al., 2015), as they evolve over time, and it is inevitable that relationship factors change by experiences and by changing actors (Janssen, 2015), or as Gefen et al. (2008) explain, trust is crucial since contracts for services are most commonly incomplete.

Schwarz (2014) noted a collection of success dimensions from literature and practice; one of these factors is the quality of the relationship. According to Kelly et al. (2002), attention to building relationships during the design and implementation of the collaboration is vital. Additionally, the results of a longitudinal survey by Mulder and Mulder (2013), is the success of automation projects determined by the ability to enter into constructive partnerships. Verstegen et al. (2006) suggest that the active involvement of all parties is an essential value in a successful partnership.

It seems especially important to look at how collaborations are started since it is the basis of a relationship (Kelly et al., 2002), and as time goes on, more relational controls of a partnership will have to be used (Verstegen et al., 2006). Partnerships are often formally determined through contractual agreements, but such agreements will soon be insufficient in a dynamic environment, with the result that they can produce a hampering result (Gelderman et al., 2015; Verstegen et al., 2006).

Kelly et al. (2002) suggest that it is advisable to focus from the beginning of the relational realm of a partnership. It is assumed here that successful collaborations must be built up from the partner selection process and be implemented during the collaboration. The recommendations are listed in Table 8.

Recommendations for a successful relationship	**Literature**
1. Systematically evaluate the relationship dimension of potential partners.	Kelly et al. (2002)
2. Negotiate agreements with building relationships in mind	

3. Choose managers and staff for collaboration based on their collaboration skills and substantive knowledge.	
4. Start small, focus on projects that provide quick feedback. These projects serve to build a collaborative culture.	
5. Identify cultural differences and develop means to bridge these cultural differences.	
6. Ensure useful communication links between partners and employees involved in the partnership.	
7. Develop measured value to evaluate and systematically review the quality of the relationship.	
8. Always be constructive in interactions with your partner	

Table 9 Recommendations for a successful relationship

Within a partnership, there is always a form of hierarchy; it indicates a particular order and is closely related to the distribution of power and dependence (Kiewiet-Kester, 2008). Janssen (2015) classifies power as one party's ability to control or affect another party's activities, and dependence as a firm's need to maintain a relationship with the partner to achieve its goals. He further distinguishes power into coercive power and non-coercive power, whereas coercive power is seen as the power to control by force, and non-coercive power the control a party has by knowledge.

As mentioned in table 8, Kelly et al. (2002) recommend creating variables that measure the quality of a relationship. However, qualitative performance criteria on, for example, trust and information transparency, seem hard for organizations to get a grip on (Martin, 2019). Measurements can help to determine how successful organizations or individuals are in achieving their goals (Martin et al., 2018). Thus, objectives can be made measurable. However, according to Ylitalo et al. (2004), there is more, and successful collaborations consist of shared goals, mutual dependency, mutual trust, long-term commitment, and effective and timely communication. Furthermore, Sarker, Ahuja, Sarker, and Kirkeby (2011) mention that the concepts of communication and trust are inherently relational.

Ali and Khan (2016) use a comparable definition and consider; joint coordination, mutual trust, knowing each other's expectations and having interdependence as essential elements for successful cooperation. While Caniëls and Gelderman (2007) plotted the power and interdependence theorem with the Kraljic matrix, the result is

visualized in Table 9. Lastly, Lane and Lum (2011) add that the key determinants of partnership quality are inter-organizational trust and shared business understandings.

	Purchasing Risk		
Influence on the Operating Results		Low	High
	High	Leverage partnerships Buyer dominated: BD<SD Moderate level of interdependence: (BD+SD) in the leverage quadrant<(BD+SD) in the strategic quadrant and (BD+SD) in the leverage quadrant>(BD+SD) in the non-critical quadrant	Strategic partnerships Balanced power: Buyer Dependence = SD Prominent level of interdependence: (BD+SD) in the strategic quadrant>(BD+SD) in each of the other quadrants
	Low	Non-critical partnerships Balanced power: BD=SD Low level of interdependence: (BD+SD) in the non-critical quadrant<(BD+SD) in each of the other quadrants	Bottleneck partnerships Supplier dominated: BD>SD Moderate level of interdependence: (BD+SD) in the bottleneck quadrant<(BD+SD) in the strategic quadrant and (BD+SD) in the bottleneck quadrant>(BD+SD) in the non-critical quadrant
		Whereas, the assumption was made that services are delivered in the form of a partnership, thus adjusted the variable "items" with "partnerships." (BD = Buyer Dependence and SD = Supplier Dependence)	

Table 10 The Kraljic Matrix with Dependence Items Applied to Partnerships.

Organizational trust

It is not feasible to view successful partnerships and trust independently, and research on inter-organizational relationships consistently poses that mutual trust is an essential factor of relationship and performance quality (Adobor, 2018; Seppänen et al., 2007). Organizational Trust can be subdivided into competence trust and goodwill trust. Competence trust is the belief that has the right competencies to be able to comply with the agreements (Nooteboom, 1996).

Bolander et al. (2018) add that successful collaborations are characterized by partners that can assume that the cooperating party is able and will act in their interest, and Rousseau, Sitkin, Burt, and Camerer (1998) observe trust as a crucial element to self-organize. Aulakh, Kotabe, and Sahay (1996) emphasize the importance of bilateral relational standards and monitoring mechanisms for building trust between organizations to keep improving performance between partnerships.

Moreover, trust also contributes to the reduction of search and tendering efforts (Wynstra, Rooks, & Snijders, 2018), and with bidirectional trust, mutual interdependence, and win-win mindset, more extended partnerships could be developed (Ali & Khan, 2016; Ylitalo et al., 2004).

Lee et al. (2009) distinguish organizational trust between generalized trust and dyadic trust. Generalized trust should be seen on an institutional level, while dyadic trust is based on direct experience of actors with each other and conclude that both types of organizational trust are essential for sharing and exchanging knowledge between partners.

The versatility in conceptualizations of trust is illustrated in the research by Seppänen et al. (2007), and the variety of relational perspectives in which trust exist in McEvily and Tortoriello (2011). According to Aulakh et al. (1996), trust is, for example, the degree of confidence that individual partners have in the reliability and integrity of each other. While Sako and Helper (1998) state that trust is an expectation that business partners will behave in a mutually acceptable way.

McEvily and Tortoriello (2011) showed, however, that even that organizational literature increasingly uses universal definitions and theoretical conceptualizations of trust, often different constructs were used to operationalize trust.

Many researchers recognize the essence of trust, but the measurement values that must be used to measure trust have inconsistencies in conceptualization & operationalization (Seppänen et al., 2007).

Organizational trust-building

Although attempts to measure trust is well reflected in the literature, research such as Kelly et al. (2002) explicitly mention that trust should be developed in the preliminary stages of a partnership. A general belief in the development of trust is that it takes time and effort (Adobor, 2018; Rousseau et al., 1998; Van Weele, 2010;

Verstegen et al., 2006; Willcocks, Lacity, & Kern, 1999). However, the element of time is not always there, and many researchers have identified organizational trust as vital for partnerships (Seppänen et al., 2007).

Trustworthiness is one of the initiators of trust (Dibbern et al., 2004; Mayer & Davis, 1999), and several researchers have established a connection between trustworthiness, reputation, past experiences information transparency. Reputation and past experiences should be a kind of knowledge that an organization can be trusted (Rousseau et al., 1998; Young-Ybarra & Wiersema, 1999), but takes time and effort to develop, and should be seen as a potential longer-term goal. Information transparency seems to be more applicable. Information transparency seems to focus more on the moment, and Pirson and Malhotra (2011) assume information transparency as a dimension of trustworthiness, while Schnackenberg and Tomlinson (2016) perceive information transparency as an initiator of trustworthiness.

Aulakh et al. (1996) suggest that the degree of trust that exists between organizations has a function as a substitute for hierarchical controls, and they assume that information transparency (open information exchange) has a positive effect on the trust between partners. A. K. Schnackenberg and Tomlinson (2016) mention that information transparency is even an essential element for mutual trust and can be meaningfully conceptualized as the degree of information disclosure, clarity, and accuracy. While, Akkermans, Bogerd, and van Doremalen (2004) conclude that collaborations require prominent levels of trust and information transparency, and Young-Ybarra and Wiersema (1999) claim that open communication leads to an increase of trust (Akkermans et al., 2004).

Kaptein and Van Tulder (2003) suggest that trust can be developed by involving each other in the dilemmas that organizations face through a stakeholder-dialogue. A dialogue is aimed at developing better interactions and strengthening the ability of people to reason together Slotte (2006), and Ali and Khan (2016) prescribe a dialogue as one of the most effective and efficient techniques for sharing information in outsourcing relationships since it contributes to a better understanding of mutual expectations. Kaptein and Van Tulder (2003) specify a dialogue with stakeholders as a method where opinions are exchanged, and expectations are discussed. Consequently, an added value of such dialogue is that it promotes greater transparency and information sharing.

Thus, a combination of time, a structured dialogue, and information transparency seem to be at least elements to enable trust between organizations. However, questions such as; “would it be sensible to wait until mutual trust has shaped over time?”, “***what should be discussed within a structured dialogue?***” and “***What issues/matters should business partners be transparent about to improve mutual trustworthiness?***” remain open after the initial literature research.

Measuring organizational trust

Expectations related to intangibles, such as trustful behaviors are difficult to quantify objectively (Dibbern et al., 2004). Nevertheless, there have been plenty of researchers who have attempted to measure trust and

trustworthiness, and Dibbern et al. (2004) remark that trustworthiness has been identified as a performance indicator for supervisors. Seppänen et al. (2007) and McEvily and Tortoriello (2011) have presented a myriad of available measurement items for organizational trust. However, using all constructs would be de trop; hence, Table 9 was prepared to eliminate the less suitable items for this research.

First, 20 studies were explored. Based on the type of relationship the studies had, 12 were eliminated due to their distant proximity to this research, and eight studies were considered further. Subsequently, the selected studies were analyzed on the proximity to a partnership for professional services and the completeness of constructs.

Among the analyzed studies, more than half of the studies were considered not suitable. Aulakh et al. (1996) appear to be particularly suitable for cross-culture studies, and Cummings and Bromiley (1996) had constructs that were especially relevant to negotiations, which made both studies to context-specific. While the target group of the research by Norman (2002) seemed to be associated with this research, the presented measurement items appeared too brief. Moreover, the analysis of Gillespie (2003) was not found in both the Open University Library and Google Scholar and was therefore excluded as a potential measurement item. Lastly, while the research of Young-Ybarra and Wiersema (1999) looked promising as they used a similar target industry and form of partnership, their research objective was the opposite of this research. Namely, their research approaches the item trust as a moderating variable in a measure to analyze the flexibility to exit the relationship even when it no longer fits the needs of the partner, while this research aims to assess trust to finetune the partnership, to remain relevant to each other.

#	**Research**	**Relationship category**	**analyzed**	**suitable**
1	Aulakh et al. (1996)	Inter-Organizational Relationships	✓	-
2	Chow and Holden (1997)	Buyer–Seller Relationships	-	-
3	Coote, Forrest, and Tam (2003)	Industrial Marketing Relationships	-	-
4	Cummings and Bromiley (1996)	Between Organizational Units	✓	-
5	Currall and Judge (1995)	Individuals Across Organizations	✓	✓
6	Doney and Cannon (1997)	Buyer–Seller Relationships	-	-
7	Dyer and Chu (2000)	Supplier–Automaker Relationships	-	-
8	Ganesan (1994)	Retail Buyer and Vendor Relationship	-	-

9	Gassenheimer and Manolis (2001)	Buyer–Seller Relationships	-	-
10	Gillespie (2003)	Working Relationships	✓	-
11	Mayer and Davis (1999)	Working Relationships	✓	✓
12	McAllister (1995)	Trust in a peer	✓	✓
13	Mollering (2002)	Buyer–Seller Relationships	-	-
14	Nooteboom et al. (1997)	Manufacturer–Supplier Relationships	-	-
15	Norman (2002)	Strategic Alliances	✓	-
16	Plank et al. (1999)	B-To-B Sales Relationships	-	-
17	Sako and Helper (1998)	Supplier–manufacturer relationships	-	-
18	Smith and Barclay (1997)	Selling partnerships	-	-
19	Young-Ybarra and Wiersema (1999)	Strategic alliances	✓	-
20	Zaheer et al. (1998)	Supplier–manufacturer relationships	-	-

Table 11 Research and Trust Items Matched

The outcome of the analysis articles resulted in three suitable studies that incorporate organizational trust in a relevant context for this research. Firstly, Mayer and Davis (1999) consider perceived trustworthiness as the proximal determinant for trust and evaluate trustworthiness along three dimensions: ability, benevolence, and integrity (Schnackenberg & Tomlinson, 2016).

- Ability represents competencies and other characteristics that allow a counterpart to have influence.
- Benevolence represents the belief that a trustee acts in the best interest of their trustor, and that actions are not entirely based on egocentric motives.
- Integrity exhibits the belief that the trustee adheres to a set of principles that the trustor finds acceptable.

Secondly, McAllister (1995) attempts to measure if there is the appropriate mindset towards competences, responsibilities, reliabilities to judge the trustworthiness of another is available. McAllister (1995) measures Trust with the items Cognition-Based Trust (CBT) and Affect-Based Trust (ABT).

- Cognition-Based Trust measures knowledge and evidence in which a rational judgment is made to make leaps of faith.
- Affect-Based Trust measures emotional bonds between individuals and relates to expressions if mutual care, concern, and welfare of another.

Thirdly, Currall, and Judge (1995) attempt to measure the willingness to engage in trusting behaviors in relation to trustworthiness. Currall and Judge (1995) called the measures boundary role persons trust instrument and created the constructs; communication, informal agreement, surveillance, and task coordination.

- Communication represents the willingness to be open and honest towards a business relation.
- Informal agreements represent the reliance on informal agreements with the partnership.
- Surveillance represents the extent of reliance one has in a partnership without maintaining surveillance.
- Task coordination represents two constructs that focus on the coordination of interdependent tasks, or more to what extent the partnership is willing to do specific tasks.

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Appendix 01b: Search Terms & Synonyms

Business literature, Thesaurus, and the Oxford Advanced Learners Dictionary were used to find synonyms of key search terms within this research.

Thesaurus	**Synonyms**
Collaboration	Alliance, Association, Buyer-Seller Relationships, Collaboration, Cooperation, Partner, Partnership, Relationships, Strategic Partnership, Teamwork.
Outsourcing	Professional Services, Secondment, Services, Source.
Actors	Active Resources, Advisor, Buyer, Consumer, Consultant, End User, Seller, Partner
Trust	Inter-Organizational Trust, Mutual Trust, Organizational Trust, Perceived Trust, Trustworthiness.
Business Process Management	Business Processes, Business Process Engineering, Business Process Reengineering, Business Process Outsourcing.
Performance	Outcome, Accomplishments.
Examination	Examination, Audit, Checking, Scan, Observation, Questioning, Review

Table 12 Thesaurus Table

Appendix 01c: Used Literature Search Terms

RESULT COUNT	SEARCH TERM	ABSTRACT READ	LITERATURE READ
97,686	(Abstract:("relationships")) and (Abstract:("IT"))	0	0
18,719	(Abstract:("Process Performance"))	0	0
8,285	(Abstract:("Performance Management"))	0	0
4704	("Association") AND ("Trustworthiness")	0	0
2006	("Strategic Partnership") AND ("performance")	0	0
1512	("Partnership") AND ("performance") AND ("Trustworthiness")	0	0
1282	("alliance") AND ("performance") AND ("Trustworthiness")	0	0
709	(Abstract:(Buyer-seller relationship))	0	0
517	("Alliance") AND ("Organizational Trust")	0	0
467	(Abstract:("business intelligence"))	0	0
453	(Abstract:(dialogue)) AND (Abstract:(innovation))	0	0
446	(Abstract:(dialogue)) AND (Abstract:(innovation)) AND (Abstract:(IT))	0	0
342	“specification” AND "Purchasing Process" AND "supplier" AND "Satisfaction"	0	0
323	(“Buyer-seller relationships”) AND ("Purchasing Process")	0	0
304	(“specification”) AND ("Purchasing Process") AND ("supplier")	0	0
192	(“Process Participant”) AND (“Human Resource Management”)	0	0
163	(“Consultant”) AND ("Purchasing Process") AND ("Business Process")	0	0
155	(“Consultant”) AND ("Purchasing Process") AND ("Business Process") AND ("Services")	0	0

144	"Satisfaction" AND "Service Purchasing"	0	0
125	(Abstract:("dialogue")) and (Abstract:("collaboration"))	0	0
110	“specification” AND "Purchasing Process" AND "Consultant" AND "Satisfaction"	0	0
89	(Abstract:("successful relationships"))	3	2
79	("professional services") AND ("Service specification")	0	5
78	(Abstract:("successful collaborations"))	2	0
75	(“Management Consultant”) AND ("Purchasing Process")	0	5
75	“specification” AND "Purchasing Process" AND "Consultant" AND "Satisfaction" AND "Service"	0	5
72	(Abstract:(Satisfaction)) AND (Abstract:(Consulting))	3	0
60	(Abstract:(dialogue)) AND (Abstract:(innovation)) AND (Abstract:(communication))	0	0
43	("successful collaborations") and ("outsourcing")	2	0
38	(Abstract:("Collaboration")) and (Abstract:("Advisor"))	0	0
37	"Purchase Satisfaction" AND "Consulting"	5	5
35	"Resource specification"	5	5
33	(Abstract:("Process Specification"))	2	0
29	"Process Participants"	3	0
23	(Abstract:("successful cooperation"))	0	0
21	(Abstract:(Outsourcing)) AND (Abstract:("partnership")) AND (Abstract:("vendor"))	5	0
19	(Abstract:("Business intelligence")) AND (Abstract:("collaboration"))	7	3

19	(“Consultant”) AND ("Purchasing Process") AND ("Process Performance")	5	5
18	("Process Participants") AND ("Process Specification")	5	5
18	Purchase Satisfaction AND "Business Services"	5	5
17	(“Active resource”) AND (“Human Resource Management”)	5	5
15	(Abstract:("Buying Services")) and (Abstract:("IT"))	3	2
14	(“Consultant”) AND ("Purchasing Process") AND ("Business Process") AND ("Professional Services")	5	5
10	("professional services") AND ("Service specification") AND ("Performance management")	5	5
10	("Active resource") AND ("Process Performance")	5	5
9	(Abstract:("Business intelligence")) AND (Abstract:("partner"))	0	0
9	(Abstract:(dialogue)) AND (Abstract:(outsourcing))	1	0
8	("effective working relationships") and ("strategic alliances")	1	0
6	(Abstract:("Active resource"))	0	0
6	(Abstract:("How to measure Success"))	0	0
6	(((“specification”) AND ("Purchasing Process") AND ("supplier") AND ("ICT")) AND "Netherlands"	5	5
5	(Abstract:("Business intelligence")) AND (Abstract:("partnership"))	0	0
3	("Business Intelligence") AND ("strategic partnership") AND ("Systematic literature review")	1	0
3	("Buying Services") AND ("Service Specification") AND ("Consultant")	3	3

3	("professional services") AND ("Service specification") AND ("Secondment")	2	1
2	(Abstract:("Consultant")) and (Abstract:("Purchasing Process"))	1	0
2	("successful collaborations") and ("business intelligence")	1	0
2	("professional services") AND ("Service specification") AND ("Performance management") AND ("Purchasing")	2	1
1	(Abstract:(Success)) AND (Abstract:("Business intelligence")) AND (Abstract:("collaboration"))	0	0
1	(Abstract:(Success)) AND (Abstract:("Business intelligence")) AND (Abstract:("outsourcing"))	0	0
1	(Abstract:(Success)) AND (Abstract:("Business intelligence")) AND (Abstract:("outsourcing"))	0	0
1	(Abstract:("How to measure Success")) AND (Abstract:(outsourcing))	1	1
1	("successful collaborations") and ("IT")	0	0
1	("professional services") AND ("Service specification") AND ("Performance management") AND ("Purchasing") AND ("Human Resource")	1	1
1	("Active resource") AND ("Process Specification")	1	1
0	(Abstract:("Business intelligence")) AND (Abstract:("outsourcing"))	0	0
0	(Abstract:(dialogue)) AND (Abstract:(innovation)) AND (Abstract:(automation))	0	0
0	("alliance relationships") and ("IT")	0	0
1	(TitleCombined:(collaborative business process)) AND (transparency)	1	1
99	(TitleCombined:(business process)) AND (transparency)	0	0

6	((Abstract:("business process reengineering")) and ((Abstract:("collaboration"))	2	2

Table 13 Search Terms OU Library Portal & Google Scholar

Appendix 01d: Analyzed Articles

PHASE	SEARCH METHOD	YEAR	ARTICLE
1	Thesis Supervisor	1998	Wilkinson, A., Redman, T., Snape, E., & Marchington, M. (1998). What do we mean by 'Quality' and 'TQM'? In Managing with Total Quality Management (pp. 7-16): Springer.
1	Thesis Supervisor	2000	Neely, A., & Adams, C. (2000). Perspectives on performance: the performance prism. Handbook of Performance Measurement.
1	Thesis Supervisor	2006	Verstegen, B., Olink, H., Vosselman, E., & Martin, H. (2006). Dynamic Links between Three Realms of Transactional Relationships.
1	Thesis Supervisor	2007	Seppänen, R., Blomqvist, K., & Sundqvist, S. (2007). Measuring inter-organizational trust—a critical review of the empirical research in 1990–2003. Industrial Marketing Management, 36(2), 249-265.
1	Thesis Supervisor	2010	Freeman, R. E. (2010). Strategic management: A stakeholder approach: Cambridge university press.
1	OU Library Portal	2011	Adamala, S., & Cidrin, L. (2011). Key Success Factors in Business Intelligence. Journal of Intelligence Studies in Business, 1(1), 107-127.
1	Thesis Supervisor	2011	McEvily, B., & Tortoriello, M. (2011). Measuring trust in organizational research: Review and recommendations. Journal of Trust Research, 1(1), 23-63.

1	OU Library Portal	2011	Ong, I. L., Siew, P. H., & Wong, S. F. (2011). A five-layered business intelligence architecture. Communications of the IBIMA.
1	Google Scholar	2013	Dumas, M., La Rosa, M., Mendling, J., & Reijers, H. A. (2013). Fundamentals of business process management (Vol. 1): Springer.
1	Thesis Supervisor	2013	Van der Valk, W., Wynstra, F., Sumo, R., Giannakis, M., Johnson, T., Miemczyk, J., . . . Bernardin, E. (2013). Three is a crowd, but in which ways? Performance-based contracting in buyer-supplier-customer triads.
1	OU Library Portal	2015	Cabanillas, C., Resinas, M., del-Río-Ortega, A., & Ruiz-Cortés, A. (2015). Specification and automated design-time analysis of the business process human resource perspective. Information Systems, 52, 55-82.
1	OU Library Portal	2015	Gelderman, C. J., Semeijn, J., & de Bruijn, A. (2015). Dynamics of service definitions—An explorative case study of the purchasing process of professional ICT-services. Journal of Purchasing and Supply Management, 21(3), 220-227.
1	OU Library Portal	2016	Ali, S., & Khan, S. U. (2016). Software outsourcing partnership model: An evaluation framework for vendor organizations. The Journal of Systems & Software, 117, 402-425.
1	Thesis Supervisor	2016	Schnackenberg, A. K., & Tomlinson, E. C. (2016). Organizational Transparency: A New Perspective on Managing Trust in Organization-Stakeholder Relationships. Journal of Management, 42(7), 1784-1810. doi:10.1177/0149206314525202
1	OU Library Portal	2018	Arias, M., Saavedra, R., Marques, M. R., Munoz-Gama, J., & Sepúlveda, M. (2018). Human resource allocation in business

			process management and process mining: A systematic mapping study. Management Decision, 56(2), 376-405.
1	OU Library Portal	2018	Bolander, P., Werr, A., & van der Valk, W. (2018). Purchasing pension advisory services in Sweden–An interpretive investigation into service conceptions and supplier selection. Industrial Marketing Management, 71, 108-122.
1	Thesis Supervisor	2018	Martin, H., Kusters, R., & Cuijpers, L. (2018). Business Processes (3 ed.). Heerlen: Open University of the Netherlands (the OUNL), Faculty of Management, Science & Technology.
2	Snowball Method	1995	Bruce, M., Leverick, F., & Littler, D. (1995). Complexities of collaborative product development. Technovation, 15(9), 535-552.
2	Snowball Method	1995	McAllister, D. J. (1995). Affect-based and cognition-based trust as foundations for interpersonal cooperation in organizations. ACADEMY OF MANAGEMENT JOURNAL, 38(1), 24-59.
2	Snowball Method	1996	Aulakh, P. S., Kotabe, M., & Sahay, A. (1996). Trust and Performance in Cross-Border Marketing Partnerships: A Behavioral Approach. Journal of International Business Studies, 27(5), 1005-1032. doi: 10.1057/palgrave.jibs.8490161
2	Snowball Method	1999	Plank, R. E., Reid, D. A., & Pullins, E. B. (1999). Perceived Trust in Business-to-Business Sales: A New Measure. The Journal of Personal Selling and Sales Management, 19(3), 61-71.
2	Snowball Method	1999	Young-Ybarra, C., & Wiersema, M. (1999). Strategic flexibility in information technology alliances: The influence of transaction cost economics and social exchange theory. Organization science, 10(4), 439-459.

2	Google Scholar	2002	Axelsson, B., & Wynstra, F. (2002). Buying Business Services: John Wiley & Sons Ltd.
2	Snowball Method	2002	Kelly, M. J., Schaan, J. L., & Joncas, H. (2002). Managing alliance relationships: Key challenges in the early stages of collaboration. R&D Management, 32(1), 11-22. doi:10.1111/1467-9310.00235
2	Thesis Supervisor	2003	Kaptein, M., & Van Tulder, R. (2003). Toward effective stakeholder dialogue. Business and society review, 108(2), 203-224.
2	OU Library Portal	2004	Koh, C., Ang, S., & Straub, D. W. (2004). IT Outsourcing Success: A Psychological Contract Perspective. Information systems research, 15(4)
2	Snowball Method	2004	Ylitalo, J., Mäki, E., & Ziegler, K. (2004). Building mutuality and trust in strategic partnership. Meaning of early stages in relationship formation: a case study. Retrieved from
2	Google Scholar	2006	Slotte, S. (2006). Systems sensitive dialogue intervention. Systems Research and Behavioral Science: The Official Journal of the International Federation for Systems Research, 23(6), 793-802.
2	OU Library Portal	2007	Baars, H., Horakh, T., & Kemper, H.-G. (2007). Business Intelligence Outsourcing–A Framework. Paper presented at the European Conference on Information Systems. St. Gallen, Switzerland.
2	OU Library Portal	2008	Qiu, L., Li, Y., & Wu, X. (2008). Protecting business intelligence and customer privacy while outsourcing data mining tasks. Knowledge and Information Systems, 17(1), 99-120.
2	OU Library Portal	2009	Lee, J.-N., Heng, C. S., & Lee, J. (2009). Multi-vendor outsourcing: Relational structures and organizational learning from a social relation perspective. ICIS 2009 Proceedings, 71.

2	Google Scholar	2009	Van der Valk, W., & Rozemeijer, F. (2009). Buying business services: towards a structured service purchasing process. Journal of services marketing, 23(1), 3-10.
2	Google Scholar	2010	Van Weele, A. J. (2010). Purchasing & Supply Chain Management: Analysis, Strategy, Planning and Practice: Cengage Learning EMEA.
2	Snowball Method	2011	Lane, M. S., & Lum, W. H. (2011). Examining client perceptions of partnership quality and the relationships between its dimensions in an IT outsourcing relationship. Australasian Journal of Information Systems, 17(1).
2	OU Library Portal	2014	Horkoff, J., Barone, D., Jiang, L., Yu, E., Amyot, D., Borgida, A., & Mylopoulos, J. (2014). Strategic business modelling: representation and reasoning.
2	OU Library Portal	2014	Schwarz, C. (2014). Toward an understanding of the nature and conceptualization of outsourcing success. Information & Management, 51(1), 152-164. doi:10.1016/j.im.2013.11.005
2	OU Library Portal	2015	Janssen, M. (2015). Relationship factors relevance on relationship value appropriation in collaborative business relationships. Open Universiteit Nederland.
2	Snowball Method	2015	Oshri, I., Kotlarsky, J., & Gerbasi, A. (2015). Strategic innovation through outsourcing: The role of relational and contractual governance. Journal of Strategic Information Systems, 24(3), 203-216
2	Google Scholar	2018	Adobor, H. (2018). A decision-based explanation of trust in interfirm alliances. Current Topics in Management, 3, 143-162.
2	Thesis Supervisor	2019	Martin, H. (2019). Measuring Qualitative Performance Criteria with Fuzzy Sets.
2	OU Library Portal	2019	Pankowska, M. (2019). Information Technology Outsourcing Chain: Literature Review and Implications for Development

			of Distributed Coordination. SUSTAINABILITY, 11(5), 1460.
2	OU Library Portal	2019	Shaikh, M., & Levina, N. (2019). Selecting an open innovation community as an alliance partner: Looking for healthy communities and ecosystems. Research Policy, 48(8), 16. doi: 10.1016/j.respol.2019.03.011
3	Snowball Method	1998	Rousseau, D. M., Sitkin, S. B., Burt, R. S., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. Academy of management review, 23(3), 393-404.
3	Snowball Method	1998	Sako, M., & Helper, S. (1998). Determinants of trust in supplier relations: Evidence from the automotive industry in Japan and the United States. Journal of Economic Behavior and Organization, 34(3), 387-417. doi:10.1016/S0167-2681(97)00082-6
3	Snowball Method	1999	Mayer, R. C., & Davis, J. H. (1999). The Effect of the Performance Appraisal System on Trust for Management: A Field Quasi-Experiment. Journal of Applied Psychology, 84(1), 123-136.
3	Snowball Method	1999	Willcocks, L. P., Lacity, M. C., & Kern, T. (1999). Risk mitigation in IT outsourcing strategy revisited: longitudinal case research at LISA.
3	Snowball Method	2001	Dirks, K. T., & Ferrin, D. L. (2001). The Role of Trust in Organizational Settings. Organization science, 12(4), 450-467. doi:10.1287/orsc.12.4.450.10640
3	Snowball Method	2004	Akkermans, H., Bogerd, P., & van Doremalen, J. (2004). Travail, transparency, and trust: A case study of computer-supported collaborative supply chain planning in high-tech electronics.
3	Snowball Method	2004	Bamford, J., Ernst, D., & Fubini, D. G. (2004). Launching a world-class joint venture82(2), 90-90.

3	Snowball Method	2004	Dibbern, J., Goles, T., Hirschheim, R., & Jayatilaka, B. (2004). Information systems outsourcing: a survey and analysis of the literature. ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 35(4), 6-102.
3	Snowball Method	2005	Kaats, E., van Klaveren, P. J., & Opheij, W. (2005). Organizing between organizations: design and management of collaborative relationships: Scriptum.
3	Snowball Method	2007	Caniëls, M. C. J., & Gelderman, C. J. (2007). Power and interdependence in buyer supplier relationships: A purchasing portfolio approach. Industrial Marketing Management, 36(2), 219-229. doi: 10.1016/j.indmarman.2005.08.012
3	Snowball Method	2008	Gefen, D., Wyss, S., & Lichtenstein, Y. (2008). Business Familiarity as Risk Mitigation in Software Development Outsourcing Contracts. MIS quarterly, 32(3), 531-551. doi:10.2307/25148855
3	Snowball Method	2011	Sarker, S., Ahuja, M., Sarker, S., & Kirkeby, S. (2011). The role of communication and trust in global virtual teams: A social network perspective. Journal of Management Information Systems, 28(1), 273-310.
3	Snowball Method	2012	Chen, H., Roger, H. L. C., & Storey, V. C. (2012). Business Intelligence and Analytics: From Big Data to Big Impact.
3	Snowball Method	2019	Božič, K., & Dimovski, V. (2019). Business intelligence and analytics for value creation: The role of absorptive capacity.

Table 14 Search Method Related to Used Articles.

APPENDIX 02: THE RESEARCH ENVIRONMENT

The selected case is a case in which there has been cooperation between a service provider and service recipients for quite some time and in which it can be expected that the objectives are clear, and the mutual cohesion is well defined. The project coordinator from a Business Intelligence Consultancy Firm and the project owner from a Clinical Research Department of an MNC were asked to fill in the Relational Calibration Survey individually. These results can be read back in appendix 07. Later, both firms received each-others perceived collaboration objectives, of which they were requested to analyze and provide feedback on the Relational Calibration Survey by filling in a feedback form as presented in appendix 05b. To conclude, the project coordinator was interviewed to elaborate on the results, which were summarized in appendix 07b.

The project coordinator of the contracted party is responsible for ensuring that the cooperation runs smoothly and works closely with both participants of the contracted party and participants of the contracting party. This is while the project owner of the contracting party is the initiator of the cooperation and engages in making collaborative decisions.

To let results be confirmed by a third party, participants of the contracted party were invited to evaluate the accuracy of the provided answers. This insight would benefit the analyses because the operational knowledge from one of the participants that did not use the Relational Calibration Survey made it possible to assess if the respondents gave valid answers, meaning they responded with an answer that was expected based on the inquired question. Thus, the provided results were, therefore, better understood, and results could be internally validated.

The analyzes of the results indeed confirmed that the respondents know the collaboration objectives, phasing, and interdependencies. Furthermore, no undesirable interdependencies between both parties were detected, and lastly, as far it was possible to estimate, respondents perceived each other as trustworthy both as an organization and as professionals.

Both organizations agreed that they started the collaboration during the brainstorming phase, intending to develop something innovative, or in other words, to increase or to develop something that has not been done before within the organization (e.g., the development of a new department.). However, the Business Intelligence Consultancy firm expects the Clinical Research Department of an MNC also to provide support to think about the potential objectives of the initiative. On further clarification, with the project coordinator, the results were somewhat misleading, because while the brainstorming phase has passed, there might have been some confusion on the phases both organizations have in total worked together and are currently busy on working together. Nevertheless, while the impact of these findings on collaboration was considered secondary to the functioning of the Relational Calibration Survey, this observed discrepancy reflected how the Matrix could be used and is further elaborated on in 4.3.

Appendix 02b: Research Environment Requirements

Location

The location where the collaboration has taken place is restricted to the location of the researcher. This research was conducted in the Netherlands between Dutch actors, a factor that should be considered when replicating the research.

The phase of the collaboration

Researchers such as Kelly et al. (2002) and Ali and Khan (2016) state that the start of the collaboration is a moment where much attention should be paid on relationship building, and Martin et al. (2018) argues that when entering into a new process, attention must be paid to the mutual coordination of roles and responsibilities.

Although it would be appealing to incorporate the prototype in a starting collaboration, it makes sense to select a case of collaboration that is in a further stage. The reasoning behind this decision is collaborations in a further stage should be able to fill in the instrument as intended.

Form of collaboration

There are various forms of collaboration within the Business Intelligence & Analytics sector. Collaborations can, for example, be aimed at advising, relieving, or innovating (Kiewiet-Kester, 2008), and the impact depends on the interdependence of the cooperating parties (Caniëls & Gelderman, 2007). Thus, a representative case must have a degree of interdependence between the cooperating parties.

The actors

Inevitably, not every actor within a collaboration is aware of everything. It is, therefore, required for the representatives to have knowledge of the cooperation objective and the implementation of activities. Thus, at least one person from each organization is required with the following criteria. To be suitable to use this prototype, an actor that uses in the prototype must;

I. Have detailed knowledge about the cooperation objectives.
II. Have detailed knowledge about its organization's objectives.
III. Be empowered to make decisions on behalf of their organization in the context of the collaboration.

APPENDIX 03: ACTIVITY MODEL OF THE PROTOTYPE (ACTION PLANNING)

The prototype is called a Relational Calibration Survey, as the mechanism pursues to calibrate the operational scope between two parties. To understand how the operational scope, roles, and responsibilities are understood between the collaborating parties, the Relational Calibration Survey has been developed with 15 questions that inquire about the operational scope, interdependencies, a timeframe, and roles and responsibilities from all participating parties.

Furthermore, the Relational Calibration Survey assesses the construct of interdependence and trustworthiness, which are explained in detail in chapter 4.4 Decision 03: Operationalization of Organizational Trust and 4.5 Decision 04: Operationalization of Interdependency.

The Relational Calibration Survey begins with the intention to collaborate, and a representative from both partners is requested to fill in the Relational Calibration Survey. The Relational Calibration Survey records operational information and relational information about the collaboration, which is upon completion analyzed by the researcher, and an invitation is sent to the respondents to participate in the dialogue. The dialogue is a dialogue wherein the results from the Relational Calibration Survey are discussed among the partners to evaluate the alignment of the perceived roles, responsibilities, and commitment to the partnership.

The used process is via an activity model diagram demonstrated in Figure 18, and a detailed description of each activity is supplied in Table 15.

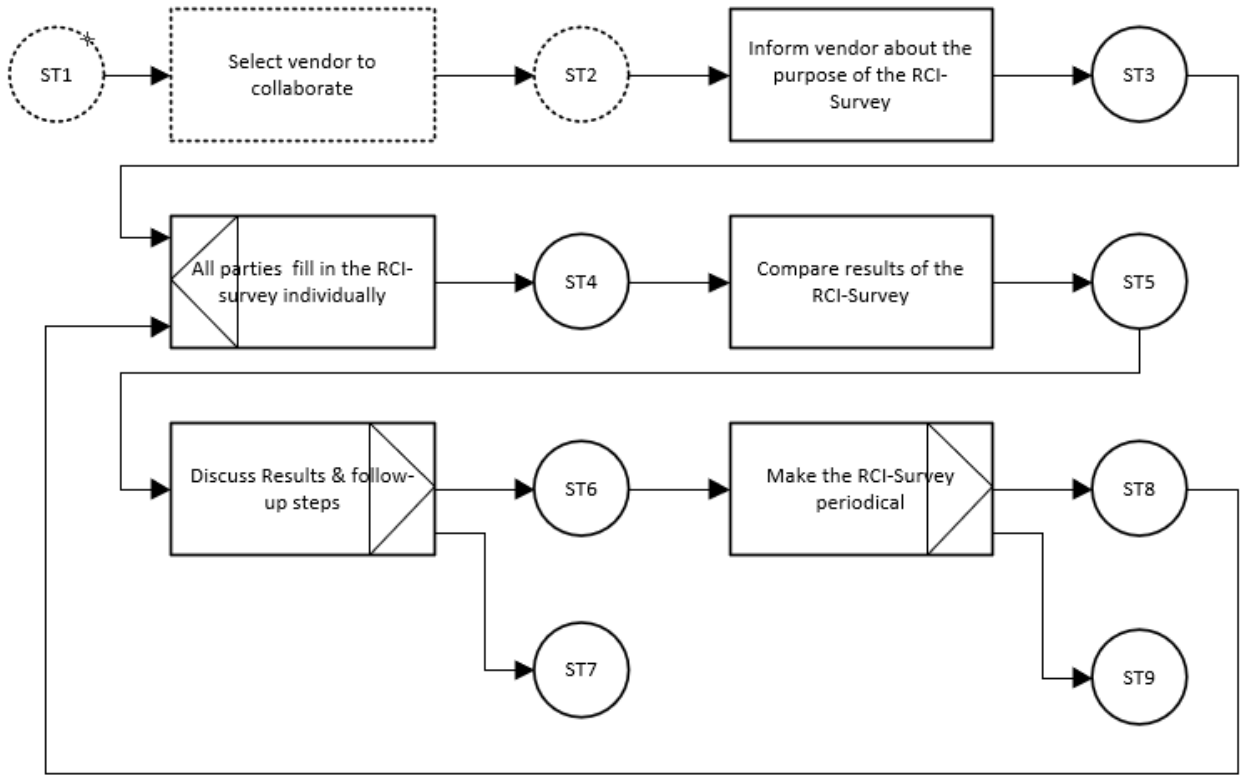


Figure 18 WFM Activity Diagram

Name	Description of the activity	Input	Output	Description of the outgoing connector(s).
Select service provider to collaborate	After a decision has been made to work together to achieve a particular goal, a process is started from selecting to requesting a collaboration.	ST1	ST2	There are at least two parties who intend to collaborate.
Inform each-other about the purpose of the Relational	A mediating party explains the purpose of the Relational Calibration Survey, hands over the URL of the Relational Calibration Survey, and invites all collaborating parties to fill in the survey individually.	ST2	ST3	The collaborating parties received the survey.

Calibration Survey				
All parties fill in the survey individually	All collaborating parties fill in the Relational Calibration Survey individually. Firstly, the collaborating parties answer 45 statements about the perceived trustworthiness and perceived interdependence they have towards each other. Secondly, the collaborating parties answer 15 questions about how they understand: The objectives of the collaboration. The phases in which both partners tend to collaborate. The perceived interdependencies. The way the partners govern these interdependencies. The timeframe in which the objectives of the collaboration have to be met.	ST3 OR ST8	ST4	For each collaborating party that has filled in the Relational Calibration Survey, a record in an Excel file is created.
Compare the results of the Relational Calibration Survey	The mediating party compares the results of the records in the Excel file. Both quantitative and qualitative questions are interpreted, and the results are shared among the collaborating parties.	ST4	ST5	All collaborating parties receive their results to validate them and are invited for a dialogue to operationalize the collaboration further.
Discuss Results & follow-up steps	The mediating party presents the results to the parties and discusses During the dialogue, the potential discrepancies to overcome these differences.	ST5	ST6 OR ST7	The conclusion is either that the differences were addressed, and the relationship is hypothetically aligned better

				than before (ST6), or one or both parties come to the conclusion that a termination of the collaboration is most beneficial (ST7).
Make the Relational Calibration Survey periodical	The mediating party offers to assess the collaboration periodical and explains that assessing the perceived trustworthiness & interdependence they have towards their partner gives insights on the health of their relationship.	ST6	ST8 or ST9	The conclusion is either that the collaboration parties agree to use the Relational Calibration Survey more often (ST8), or one or both parties do not want to continue using the Relational Calibration Survey (ST7).

Table 15 WFM Activity Diagram Descriptions

Appendix 03b: Reading Guide of the Activity Model

The following information is derived from Martin et al. (2018).

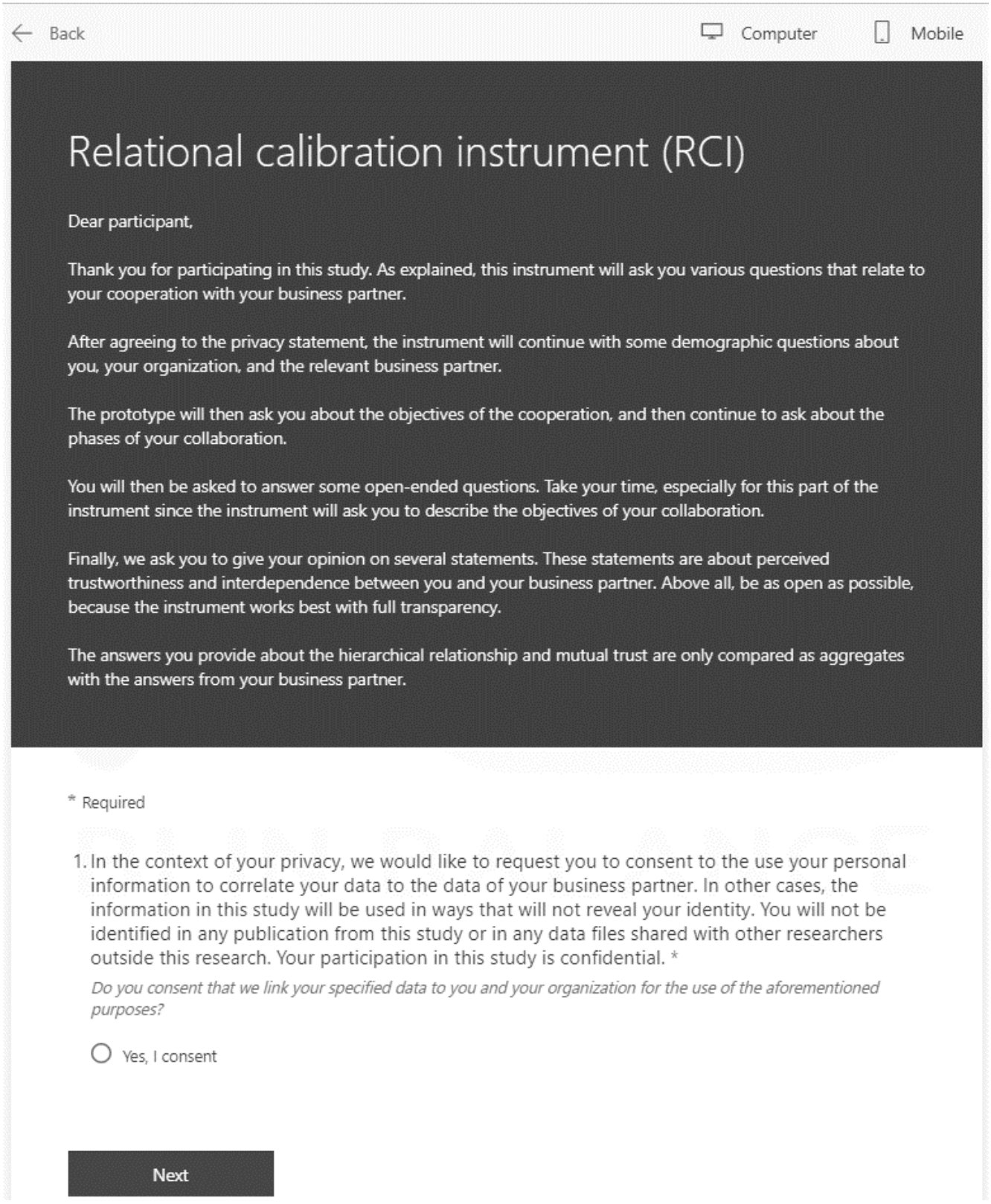
The activity model is a modeling technique that maps out the activities that make up a process. The activity model makes it possible to model processes within which sequential, parallel, selective, and iterative trajectories. The activity model presents the process based on activities and sub-states and is based on the formally described Petri-net modeling technique. Activities and sub-states are linked with arrows.

- A sub-state is illustrated with a circle. A sub-state is a neutral, not active thing.
- Activities are displayed with rectangles. Within the rectangles are symbols, on the left for the incoming flank, and on the right for the outgoing flank. Figure 19 illustrates the meaning of each rectangle.

Symbol	*Meaning*
	An activity with: • one incoming or OR-join • one outgoing or OR-split
	An activity with: • one incoming or OR-join • outgoing AND-split
	An activity with: • one incoming or OR-join • outgoing XOR-split
	An activity with: • incoming AND-join • one outgoing or OR-split
	An activity with: • incoming XOR-join* • one outgoing or OR-split
	An activity with: • incoming AND-join • outgoing AND-split
	An activity with: • incoming XOR-join* • outgoing XOR-split
	An activity with: • incoming AND-join • outgoing XOR-split
	An activity with: • incoming XOR-join* • outgoing AND-split
	A sub-state
	A link between: • a sub-state and an activity, or • an activity and a sub-state

Figure 19 Activity Model Symbols and Definitions

APPENDIX 04: THE RELATIONAL CALIBRATION SURVEY



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Relational calibration instrument (RCI)

Dear participant,

Thank you for participating in this study. As explained, this instrument will ask you various questions that relate to your cooperation with your business partner.

After agreeing to the privacy statement, the instrument will continue with some demographic questions about you, your organization, and the relevant business partner.

The prototype will then ask you about the objectives of the cooperation, and then continue to ask about the phases of your collaboration.

You will then be asked to answer some open-ended questions. Take your time, especially for this part of the instrument since the instrument will ask you to describe the objectives of your collaboration.

Finally, we ask you to give your opinion on several statements. These statements are about perceived trustworthiness and interdependence between you and your business partner. Above all, be as open as possible, because the instrument works best with full transparency.

The answers you provide about the hierarchical relationship and mutual trust are only compared as aggregates with the answers from your business partner.

* Required

1. In the context of your privacy, we would like to request you to consent to the use your personal information to correlate your data to the data of your business partner. In other cases, the information in this study will be used in ways that will not reveal your identity. You will not be identified in any publication from this study or in any data files shared with other researchers outside this research. Your participation in this study is confidential. *

   Do you consent that we link your specified data to you and your organization for the use of the aforementioned purposes?

   ○ Yes, I consent

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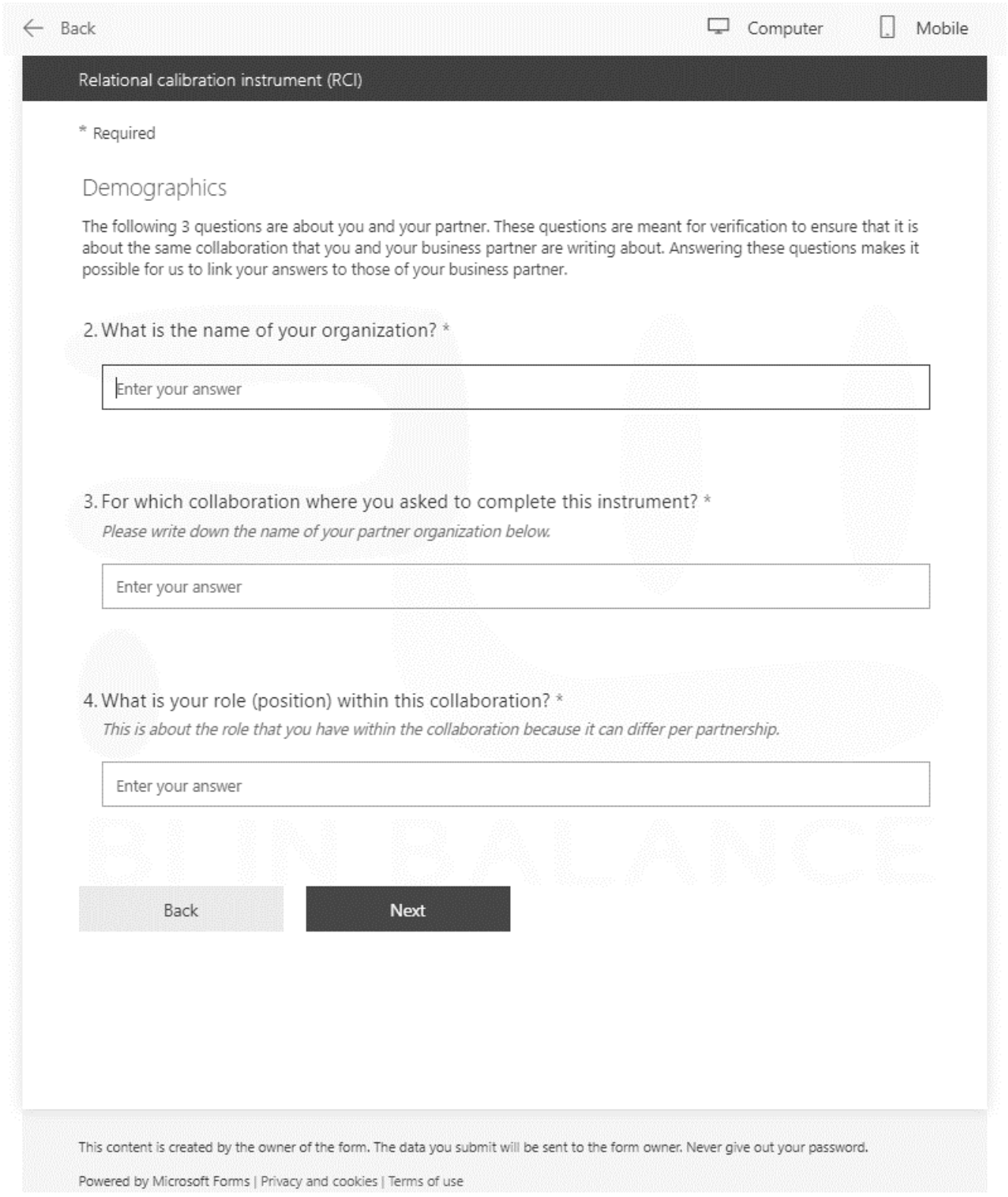
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Computer
Mobile
Relational calibration instrument (RCI)
* Required
Demographics
The following 3 questions are about you and your partner. These questions are meant for verification to ensure that it is about the same collaboration that you and your business partner are writing about. Answering these questions makes it possible for us to link your answers to those of your business partner.
2. What is the name of your organization? *
Enter your answer
3. For which collaboration where you asked to complete this instrument? *
Please write down the name of your partner organization below.
Enter your answer
4. What is your role (position) within this collaboration? *
This is about the role that you have within the collaboration because it can differ per partnership.
Enter your answer
Back
Next
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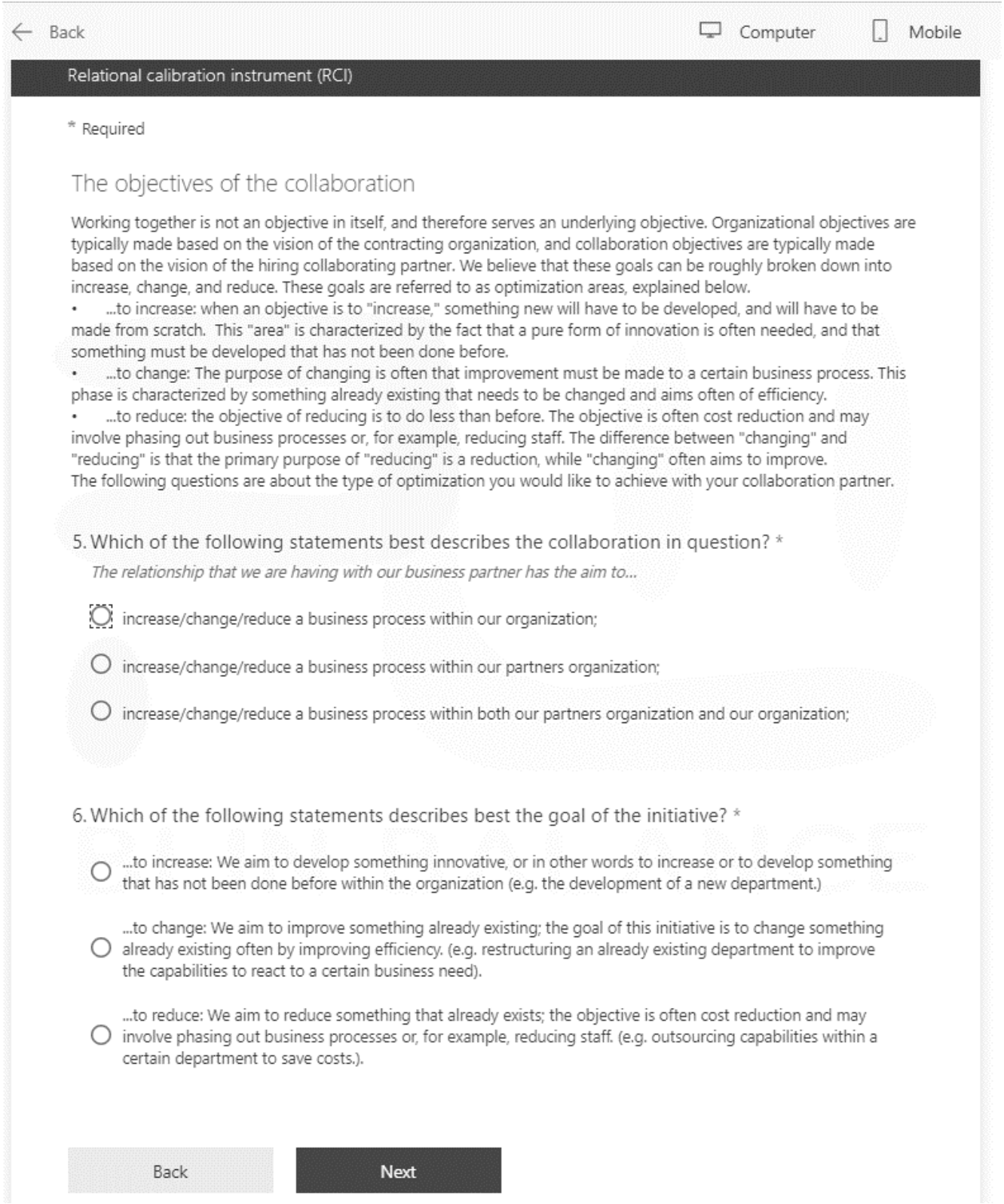
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Computer
Mobile
Relational calibration instrument (RCI)
* Required
The objectives of the collaboration
Working together is not an objective in itself, and therefore serves an underlying objective. Organizational objectives are typically made based on the vision of the contracting organization, and collaboration objectives are typically made based on the vision of the hiring collaborating partner. We believe that these goals can be roughly broken down into increase, change, and reduce. These goals are referred to as optimization areas, explained below.
• ...to increase: when an objective is to "increase," something new will have to be developed, and will have to be made from scratch. This "area" is characterized by the fact that a pure form of innovation is often needed, and that something must be developed that has not been done before.
• ...to change: The purpose of changing is often that improvement must be made to a certain business process. This phase is characterized by something already existing that needs to be changed and aims often of efficiency.
• ...to reduce: the objective of reducing is to do less than before. The objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. The difference between "changing" and "reducing" is that the primary purpose of "reducing" is a reduction, while "changing" often aims to improve.
The following questions are about the type of optimization you would like to achieve with your collaboration partner.
5. Which of the following statements best describes the collaboration in question? *
The relationship that we are having with our business partner has the aim to...
increase/change/reduce a business process within our organization;
increase/change/reduce a business process within our partners organization;
increase/change/reduce a business process within both our partners organization and our organization;
6. Which of the following statements describes best the goal of the initiative? *
...to increase: We aim to develop something innovative, or in other words to increase or to develop something that has not been done before within the organization (e.g. the development of a new department.)
...to change: We aim to improve something already existing; the goal of this initiative is to change something already existing often by improving efficiency. (e.g. restructuring an already existing department to improve the capabilities to react to a certain business need).
...to reduce: We aim to reduce something that already exists; the objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. (e.g. outsourcing capabilities within a certain department to save costs.).
Back
Next

* Required

The phase of the collaboration

To get a good understanding of the collaboration it is necessary to clarify to what extent the partner is inquired to work along. This means that you want to be able to identify the phases of partnering because a different attitude is relevant to each phase.

Keep in mind that these questions are about cooperation between your organization and the partner organization.

7. Which of the following statements describes best in which phase you expect your business partner to start the collaboration? *

To clarify the first moment in which you and your business partner started working together for this specific initiative.

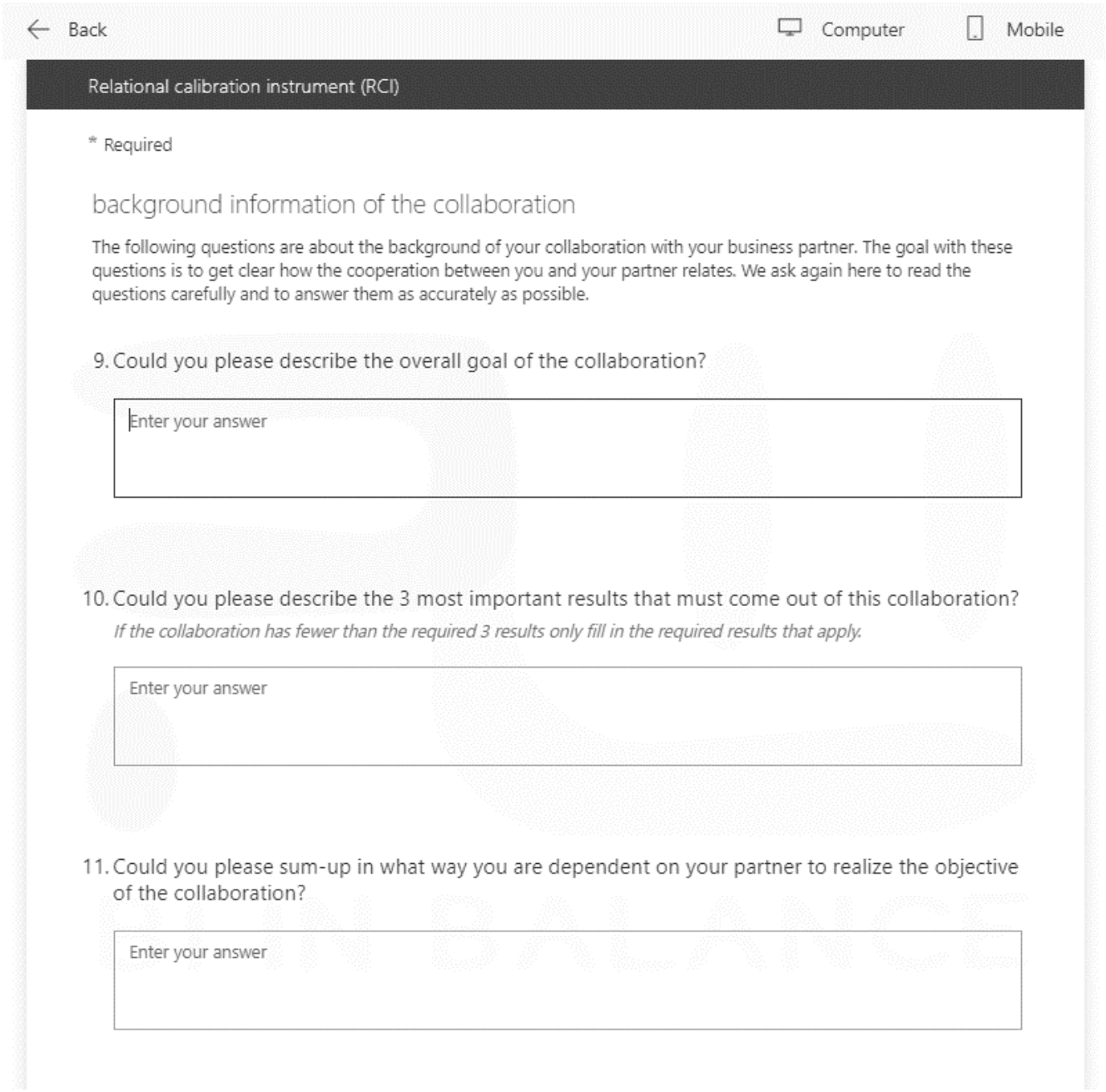
- ◌ Brainstorming phase: The problem or challenge is clear, but there is still little insight into what exactly needs to be achieved. We expect our partner to support us to think about potential objectives of the initiative
- ○ Converge phase: The problem or challenge is clear, and there is insight into what approximately needs to be achieved. We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.
- ○ Planning phase: There is insight into what exactly needs to be achieved, but not yet how it must be executed. We expect our partner to support us to draw up the plan for achieving these objectives.
- ○ Executing phase: There is insight into what exactly needs to be achieved and a plan on how it must be executed. We expect our partner to help us with the implementation of these objectives.

8. Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)?

This question concerns the entire cooperation for the specific initiative, so several phases are possible here. (multiple choice)

- ☐ We expect our partner to support us to think about potential objectives of the initiative.
- ☐ We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.
- ☐ We expect our partner to support us to draw up the plan for achieving these objectives.
- ☐ We expect our partner to help us with the implementation of these objectives.

Back Next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Relational calibration instrument (RCI)
* Required
background information of the collaboration
The following questions are about the background of your collaboration with your business partner. The goal with these questions is to get clear how the cooperation between you and your partner relates. We ask again here to read the questions carefully and to answer them as accurately as possible.
9. Could you please describe the overall goal of the collaboration?
Enter your answer
10. Could you please describe the 3 most important results that must come out of this collaboration?
If the collaboration has fewer than the required 3 results only fill in the required results that apply.
Enter your answer
11. Could you please sum-up in what way you are dependent on your partner to realize the objective of the collaboration?
Enter your answer

12. Could you please sum-up in what way your partner is dependent on you to realize the objective of the collaboration?

Enter your answer

13. Could you please describe what needs to be organized to govern these dependencies?

Enter your answer

14. Related to the goals that you have stated in question 10 "Could you please describe the 3 most important results that must come out of this collaboration?". Could you please provide a time frame in which you expect that the collaboration reaches its result(s)? *

	0 months to 3 months	3 months to 6 months	6 months to 12 months	1 year to 2 years	2 year or longer	Not applicable
Result 1	○	○	○	○	○	○
Result 2	○	○	○	○	○	○
Result 3	○	○	○	○	○	○

15. Would there be anything else that is required to make the collaboration a success?

Enter your answer

Back Next

The following statements are about your perception of the relevant partner organization as a whole. We would ask you to read the statements well and answer them STRONGLY AGREE = if you fully agree, and STRONGLY DISAGREE if you totally disagree.

16. .

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
We must comply with our business partner even if it is beyond the contract.	○	○	○	○	○
We can't gain their special treatment if we don't meet their requests.	○	○	○	○	○
We avoid many difficulties as we meet our business partners requests	○	○	○	○	○
Our business partner usually suggest that they will increase the price if we don't meet their requests	○	○	○	○	○
Our business partner won't give us necessary service if we don't meet their requests.	○	○	○	○	○

17. .

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner has more useful information than us.	○	○	○	○	○
Our business partner convinced us that it made sense to follow their suggestions.	○	○	○	○	○
Our business partner's expertise enabled them to give us proper suggestions.	○	○	○	○	○
We usually got bad advice from our business partner.	○	○	○	○	○
This partner did what we anticipated because we had largely similar business philosophies.	○	○	○	○	○

18. .

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner would be costly to lose.	○	○	○	○	○
Our business partner would be easy to replace.	○	○	○	○	○
We are dependent on our business partner.	○	○	○	○	○
Our business partner would find it costly to lose us.	○	○	○	○	○
Our business partner would find it difficult to replace us.	○	○	○	○	○
Our business partner needs our expertise.	○	○	○	○	○
Our business partner is dependent on us.	○	○	○	○	○

19. .

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
My business partner is very capable of performing its job.	○	○	○	○	○
My business partner is known to be successful at the things it tries to do.	○	○	○	○	○
My business partner has much knowledge about the work that needs to be done.	○	○	○	○	○
I feel very confident about my business partner's skills.	○	○	○	○	○
My business partner has specialized capabilities that can increase our performance.	○	○	○	○	○
My business partner is well qualified.	○	○	○	○	○

21..

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
My business partner has a strong sense of justice.	○	○	○	○	○
I never have to wonder whether my business partner will stick to its word.	○	○	○	○	○
My business partner tries hard to be fair in dealings with others.	○	○	○	○	○
The actions and behaviors of my business partner are not very consistent.	○	○	○	○	○
I like my business partner's values.	○	○	○	○	○
Sound principles seem to guide my business partner's behavior.	○	○	○	○	○

22. .

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
My business partner's representative approaches his/her job with professionalism and dedication.	○	○	○	○	○
Given my business partner's representative record, I see no reason to doubt his/her competence and preparation for the job.	○	○	○	○	○
I can rely on my business partner's representative not to make my job more difficult by careless work.	○	○	○	○	○
Other work associates of mine who must interact with my business partner's representative consider him/her to be trustworthy.	○	○	○	○	○
If people knew more about my business partner's representative background, they would be more concerned and monitor his/her performance more closely.	○	○	○	○	○
Most people, even those who aren't close friends of my business partner's representative, trust and respect him/her at work.	○	○	○	○	○

23..

	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.	○	○	○	○	○
I can talk freely to my business partner's representative about difficulties I am having at work and know that (s)he will want to listen.	○	○	○	○	○
We would both feel a sense of loss if one of us was transferred and we could no longer work together.	○	○	○	○	○
If I shared my problems with my business partner's representative, I know (s)he would respond constructively and caringly.	○	○	○	○	○
I would have to say that we have both made considerable emotional investments in our working relationship.	○	○	○	○	○

Back Submit

Appendix 04b: Relational Calibration Survey PDF Version

The appendix illustrates the provided results from one of the respondents.

RELATIONAL CALIBRATION INSTRUMENT

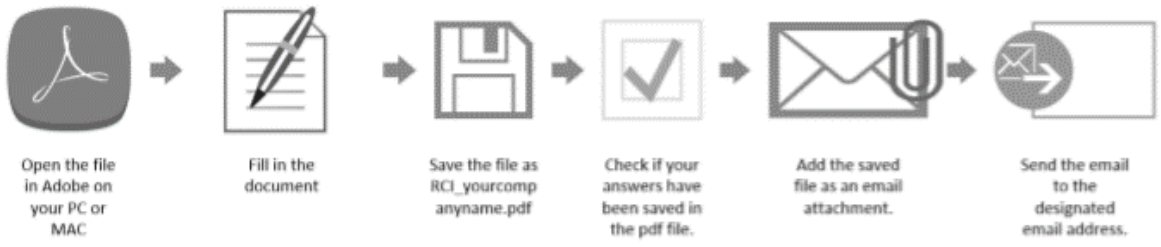
Dear participant,

Thank you for participating in this study. This instrument will ask you various questions that relate to your cooperation with your business partner. After agreeing to the privacy statement, the instrument will continue with some demographic questions about you, your organization, and the relevant business partner.

The tool will then ask you about the objectives of the cooperation, and then continue to ask about the phases of your collaboration. You will then be asked to answer some open-ended questions. Take your time, especially for this part of the instrument since the instrument will ask you to describe the objectives of your collaboration. Finally, we ask you to give your opinion on several statements.

These statements are about trust and a mutual hierarchy between you and your business partner. Above all, be as open as possible, because the instrument works best with full transparency. The answers you provide about the hierarchical relationship and mutual trust are only compared as aggregates with the answers from your business partner.

- The instrument contains 60 questions, 9 of which are open questions and 51 are multiple-choice questions.
- Completing the instrument takes around 15 to 45 minutes.



This version is the alternative version of the instrument that can also be accessed via Microsoft Forms. The instrument is a PDF file in which you have the option to answer the questions manually or via Adobe Reader. Below is a process on how to use this PDF.

To be able to fill in the file, it is advisable to open the file in Adobe Acrobat Reader. This means the actual reader and not a reader in the web browser. The reason for this is that you must be able to save the file. In addition, it is advisable to enter it on a MAC / Windows computer.

This instrument was made as part of a master's thesis for the degree MSc. Business Process Management & IT at the Open Universiteit Nederland.

Privacy

In the context of your privacy, we would like to request you to consent to the use your personal information to correlate your data to the data of your business partner. In other cases, the information in this study will be used in ways that will not reveal your identity. You will not be identified in any publication from this study or in any data files shared with other researchers outside this research. Your participation in this study is confidential.

---

01) Do you consent that we link your specified data to you and your organization for the use of the aforementioned purposes?

☐ Yes, I consent

Demographics

The following 3 questions are about you and your partner. These questions are meant for verification to ensure that it is about the same collaboration that you and your business partner are writing about. Answering these questions makes it possible for us to link your answers to those of your business partner.

---

02) What is the name of your organization? *

---

03) For which collaboration where you asked to complete this instrument? (Please write down the name of your partner organization below.) *

---

04) What is your role (position) within this collaboration? (This is about the role that you have within the collaboration because it can differ per partnership) *

The objectives of the collaboration

Working together is not an objective in itself, and therefore serves an underlying objective. Organizational objectives are typically made based on the vision of the contracting organization, and collaboration objectives are typically made based on the vision of the hiring collaborating partner. We believe that these goals can be roughly broken down into increase, change, and reduce. These goals are referred to as optimization areas, explained below.

- ...to increase: when an objective is to "increase," something new will have to be developed, and will have to be made from scratch. This "area" is characterized by the fact that a pure form of innovation is often needed, and that something must be developed that has not been done before.
- ...to change: The purpose of changing is often that improvement must be made to a certain business process. This phase is characterized by something already existing that needs to be changed and aims often of efficiency.
- ...to reduce: the objective of reducing is to do less than before. The objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. The difference between "changing" and "reducing" is that the primary purpose of "reducing" is a reduction, while "changing" often aims to improve.

The following questions are about the type of optimization you would like to achieve with your collaboration partner.

---

05) Which of the following statements best describes the collaboration in question? The relationship that we are having with our business partner has the aim to… *

◯ increase/change/reduce a business process within our organization;

◯ increase/change/reduce a business process within our partners organization;

◯ increase/change/reduce a business process within both our partners organization and our organization;

---

06) Which of the following statements describes best the goal of the initiative? *

◯ ...to increase: We aim to develop something innovative, or in other words to increase or to develop something that has not been done before within the organization (e.g. the development of a new department.)

◯ ...to change: We aim to improve something already existing; the goal of this initiative is to change something already existing often by improving efficiency. (e.g. restructuring an already existing department to improve the capabilities to react to a certain business need).

◯ ...to reduce: We aim to reduce something that already exists; the objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. (e.g. outsourcing capabilities within a certain department to save costs.).

5

The phase of the collaboration

To get a good understanding of the collaboration it is necessary to clarify to what extent the partner is inquired to work along. This means that you want to be able to identify the phases of partnering because a different attitude is relevant to each phase.

Keep in mind that these questions are about cooperation between your organization and the partner organization.

---

07) Which of the following statements describes best in which phase you expect your business partner to start the collaboration? To clarify the first moment in which you and your business partner started working together for this specific initiative. *

◯ Brainstorming phase: The problem or challenge is clear, but there is still little insight into what exactly needs to be achieved. We expect our partner to support us to think about potential objectives of the initiative.

◯ Converge phase: The problem or challenge is clear, and there is insight into what approximately needs to be achieved. We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.

◯ Planning phase: There is insight into what exactly needs to be achieved, but not yet how it must be executed. We expect our partner to support us to draw up the plan for achieving these objectives.

◯ Executing phase: There is insight into what exactly needs to be achieved and a plan on how it must be executed. We expect our partner to help us with the implementation of these objectives.

---

08) Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)? This question concerns the entire cooperation for the specific initiative, so several phases are possible here. (multiple choice). *

☐ We expect our partner to support us to think about potential objectives of the initiative.

☐ We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative.

☐ We expect our partner to support us to draw up the plan for achieving these objectives.

☐ We expect our partner to help us with the implementation of these objectives.

Background information on the collaboration

The following questions are about the background of your collaboration with your business partner. The goal with these questions is to get clear how the cooperation between you and your partner relates. We ask again here to read the questions carefully and to answer them as accurately as possible.

---

09. Could you please describe the overall goal of the collaboration? *

---

10. Could you please describe the 3 most important results that must come out of this collaboration? (If the collaboration has fewer than the required 3 results, please only fill in the required results that apply and write n/a at the other results.) *

	Description of the result
Result 1	
Result 2	
Result 3	

---

11. Could you please sum-up in what way you are dependent on your partner to realize the objective of the collaboration? *

12. Could you please sum-up in what way your partner is dependent on you to realize the objective of the collaboration? *

13. Could you please describe what needs to be organized to govern these dependencies? *

14. Related to the goals that you have stated in question 10 "Could you please describe the 3 most important results that must come out of this collaboration?". Could you please provide a time frame in which you expect that the collaboration reaches its result(s)? *

	Time
Result 1	
Result 2	
Result 3	

15. Would there be anything else that is required to make the collaboration a success? *

Scoring model I

The following statements are about your perception of the relevant partner organization as a whole. We would ask you to read the statements well and answer them STRONGLY AGREE = if you fully agree, and STRONGLY DISAGREE if you totally disagree.

*

	strongly agree	agree	neutral	disagree	strongly disagree
16) We must comply with our business partner even if it is beyond the contract.	○	○	○	○	○
17) We can't gain their special treatment if we don't meet their requests.	○	○	○	○	○
18) We avoid many difficulties as we meet our business partners requests.	○	○	○	○	○
19) Our business partner usually suggests that they will increase the price if we don't meet their requests.	○	○	○	○	○
20) Our business partner won't give us the necessary service if we don't meet their requests.	○	○	○	○	○

*

	strongly agree	agree	neutral	disagree	strongly disagree
21) Our business partner has more useful information than us.	○	○	○	○	○
22) Our business partner convinced us that it made sense to follow their suggestions.	○	○	○	○	○
23) Our business partner's expertise enabled them to give us proper suggestions.	○	○	○	○	○
24) We usually got bad advice from our business partner	○	○	○	○	○
25) This partner did what we anticipated because we had largely similar business philosophies.	○	○	○	○	○

*

	strongly agree	agree	neutral	disagree	strongly disagree
26) Our business partner would be costly to lose.	○	○	○	○	○
27) Our business partner would be easy to replace.	○	○	○	○	○
28) We are dependent on our business partner.	○	○	○	○	○
29) Our business partner would find it costly to lose us.	○	○	○	○	○
30) Our business partner would find it difficult to replace us.	○	○	○	○	○
31) Our business partner needs our expertise.	○	○	○	○	○
32) Our business partner is dependent on us.	○	○	○	○	○

*

	strongly agree	agree	neutral	disagree	strongly disagree
33) Our business partner is very capable of performing its job.	○	○	○	○	○
34) Our business partner is known to be successful at the things it tries to do.	○	○	○	○	○
35) Our business partner has much knowledge about the work that needs to be done.	○	○	○	○	○
36) I feel very confident about my business partner's skills.	○	○	○	○	○
37) Our business partner has specialized capabilities that can increase our performance.	○	○	○	○	○
38) Our business partner is well qualified.	○	○	○	○	○

10

*

	strongly agree	agree	neutral	disagree	strongly disagree
39) Our business partner is very concerned about our welfare.	○	○	○	○	○
40) Our needs and desires are very important to our business partner.	○	○	○	○	○
41) Our business partner would not knowingly do anything to damage us.	○	○	○	○	○
42) Our business partner really looks out for what is important to us.	○	○	○	○	○
43) Our business partner will go out of its way to help us.	○	○	○	○	○

---

*

	strongly agree	agree	neutral	disagree	strongly disagree
44) Our business partner has a strong sense of justice.	○	○	○	○	○
45) I never have to wonder whether our business partner will stick to its word.	○	○	○	○	○
46) My business partner tries hard to be fair in dealings with others.	○	○	○	○	○
47) The actions and behaviors of our business partner are not very consistent.	○	○	○	○	○
48) I like our business partner's values.	○	○	○	○	○
49) Sound principles seem to guide our business partner's behavior.	○	○	○	○	○

Scoring model II

The following statements are about the person with whom you collaborate most during this organizational collaboration. We would ask you to read the statements well and answer them.

1 = strongly disagree || 2 = disagree || 3 = neutral || 4 = agree || 5 = strongly agree

---

50) My business partner's representative approaches his/her job with professionalism and dedication. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

51) Given my business partner's representative record, I see no reason to doubt his/her competence and preparation for the job. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

52) I can rely on my business partner's representative not to make my job more difficult by careless work. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

53) Other work associates of mine who must interact with my business partner's representative consider him/her to be trustworthy. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

54) If people knew more about my business partner's representative background, they would be more concerned and monitor his/her performance more closely. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

Scoring model II

The following statements are about the person with whom you collaborate most during this organizational collaboration. We would ask you to read the statements well and answer them.

1 = strongly disagree || 2 = disagree || 3 = neutral || 4 = agree || 5 = strongly agree

---

55) Most people, even those who aren't close friends of my business partner's representative, trust and respect him/her at work. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

56) We have a sharing relationship. We can both freely share our ideas, feelings, and hopes. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

57) I can talk freely to my business partner's representative about the difficulties I am having at work and know that (s)he will want to listen. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

58) We would both feel a sense of loss if one of us was transferred and we could no longer work together. *

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

59) If I shared my problems with my business partner's representative, I know (s)he would respond constructively and caringly.

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

---

60) I would have to say that we have both made considerable emotional investments in our working relationship.

	1	2	3	4	5	
strongly disagree	◯	◯	◯	◯	◯	strongly agree

Open the file in Adobe on your PC or MAC

Fill in the document

Save the file as RCI_yourcompanyname.pdf

Check if your answers have been saved in the pdf file.

Add the saved file as an email attachment.

Send the email to the designated email address.

Thank you for answering all the questions. We are almost done now. The only thing left is to save the file and send it by email to the email address below.

julien.hoornweg@pwconsulting.nl

Thank you!

Appendix 04c: Relational Calibration Survey in Word format

Dear participant,

Thank you for participating in this research. As explained, this instrument will ask you various questions that relate to your cooperation with your business partner.

After agreeing to the privacy statement, the instrument will continue with some demographic questions about you, your organization, and the relevant business partner.

The tool will then ask you about the objectives of the cooperation, and then continue to ask about the phases of your collaboration

You will then be asked to answer some open-ended questions. Take your time, especially for this part of the instrument, since the instrument will ask you to describe the objectives of your collaboration.

Finally, we ask you to give your opinion on several statements. These statements are about trust and a mutual hierarchy between you and your business partner. Above all, be as open as possible, because the instrument works best with full transparency.

The answers you provide about the hierarchical relationship and mutual trust are only compared as aggregates with the answers from your business partner.

End of the introduction

In the context of your privacy, we would like to request you to consent to the use of your personal information to correlate your data to the data of your business partner. In other cases, the information in this research will be used in ways that will not reveal your identity. You will not be identified in any publication from this research or in any data files shared with other researchers outside this research. Your participation in this research is confidential.

1) Do you consent that we link your specified data to you and your organization for the use of the aforementioned purposes?
☐ Yes, I consent

<< New section >>

Demographics

The following three questions are about you and your partner. These questions are meant for verification to ensure that it is about the same collaboration that you and your business partner are writing about. Answering these questions makes it possible for us to link your answers to those of your business partner.

2) What is the name of your organization?

3) For which collaboration where you asked to complete this instrument?
Please write down the name of your partner organization below.

4) What is your role (position) within this collaboration?
This is about the role that you have within the collaboration because it can differ per partnership.

<< New section >>

The objectives of the collaboration

Working together is not an objective in itself, and therefore serves an underlying objective. Organizational objectives are typically made based on the vision of the contracting organization, and collaboration objectives are typically made based on the vision of the hiring collaborating partner. We believe that these goals can be roughly broken down into increase, change, and reduce. These goals are referred to as optimization areas, explained below.

- ...to increase: when an objective is to "increase," something new will have to be developed, and will have to be made from scratch. This "area" is characterized by the fact that a pure form of innovation is often needed, and that something must be developed that has not been done before.
- ...to change: The purpose of changing is often that improvement must be made to a certain business process. This phase is characterized by something already existing that needs to be changed and often aims of efficiency.
- ...to reduce: the objective of reducing is to do less than before. The objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. The difference between "changing" and "reducing" is that the primary purpose of "reducing" is a reduction, while "changing" often aims to improve.

The following questions are about the type of optimization you would like to achieve with your collaboration partner.

5) Which of the following statements best describes the collaboration in question?
The relationship that we are having with our business partner has the aim to…
☐ increase/change/reduce a business process within our organization.
☐ increase/change/reduce a business process within our partners organization.
☐ increase/change/reduce a business process within both our partners organization and our organization.

6) Which of the following statements best describes the goal of the initiative?
☐ ...to increase: We aim to develop something innovative, or in other words to increase or to develop something that has not been done before within the organization (e.g., the development of a new department.).
☐ ...to change: We aim to improve something already existing; the goal of this initiative is to change something already existing often by improving efficiency. (e.g., restructuring an already existing department to improve the capabilities to react to a certain business need).
☐ ...to reduce: We aim to reduce something that already exists; the objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. (e.g., outsourcing capabilities within a certain department to save costs.).

<< New section >>

The phase of the collaboration

To get a good understanding of the collaboration, it is necessary to clarify to what extent the partner is inquired to work along. This means that you want to be able to identify the phases of partnering because a different attitude is relevant to each phase.

Keep in mind that these questions are about cooperation between your organization and the partner organization.

7) Which of the following statements describes best in which phase you expect your business partner to start the collaboration?
To clarify the first moment in which you and your business partner started working together for this specific initiative.
☐ Brainstorming phase: The problem or challenge is clear, but there is still little insight into what exactly needs to be achieved. We expect our partner to be involved in thinking about the potential objectives of the initiative.
☐ Converge phase: The problem or challenge is clear, and there is an insight into what approximately needs to be achieved. We expect our partner to be involved in turning the brainstormed ideas into feasible objectives for the initiative.
☐ Planning phase: There is an insight into what exactly needs to be achieved, but not yet how it must be executed. We expect our partner to be involved in drawing up the plan for achieving these objectives.
☐ Executing phase: There is an insight into what exactly needs to be achieved and a plan on how it must be executed. We expect our partner to be involved with the implementation of these objectives.

8) Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)?
This question concerns the entire cooperation for the specific initiative, so several phases are possible here. (multiple choice)
☐ We expect our partner to be involved in thinking about the potential objectives of the initiative.
☐ We expect our partner to be involved in turning the brainstormed ideas into feasible objectives for the initiative.
☐ We expect our partner to be involved in drawing up the plan for achieving these objectives.
☐ We expect our partner to be involved with the implementation of these objectives.

<< New section >>

Background information on the collaboration

The following questions are about the background of your collaboration with your business partner. The goal with these questions is to get clear how the cooperation between you and your partner relates. We ask again here to read the questions carefully and to answer them as accurately as possible.

9) Could you please describe the overall goal of the collaboration?

10) Could you please describe the three most important results that must come out of this collaboration?
If the collaboration has fewer than the required three results, only fill in the required results that apply.
1. 2. 3.

11) Could you please sum-up in what way you are dependent on your partner to realize the objective of the collaboration?

12) Could you please sum-up in what way your partner is dependent on you to realize the objective of the collaboration?

13) Could you please describe what needs to be organized to govern these dependencies?

Related to the goals that you have stated in question 10, "Could you please describe the three most important results that must come out of this collaboration?". Could you please provide a period in which you expect that the collaboration reaches its result(s)?

	0 months to 3 months	3 months to 6 months	6 months to 12 months	1 year to 2 years	2 year or longer	Not applicable
Result 1						
Result 2						
Result 3						

14) Would there be anything else that is required to make the collaboration a success?

<< New section >>

The following statements are about your perception of the relevant partner organization as a whole. We would ask you to read the statements well and answer them STRONGLY AGREE = if you fully agree, and STRONGLY DISAGREE if you totally disagree.

15) Coercive Power (Y. Liu et al., 2010)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
We must comply with our business partner even if it is beyond the contract.	☐	☐	☐	☐	☐
We cannot gain their special treatment if we do not meet their requests.	☐	☐	☐	☐	☐
We avoid many difficulties as we meet our business partners requests	☐	☐	☐	☐	☐
Our business partner usually suggest that they will increase the price if we do not meet their requests	☐	☐	☐	☐	☐
Our business partner will not give us the necessary service if we do not meet their requests.	☐	☐	☐	☐	☐

16) Non-Coercive Power (Y. Liu et al., 2010)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner has more useful information than us.	☐	☐	☐	☐	☐
Our business partner convinced us that it made sense to follow their suggestions.	☐	☐	☐	☐	☐
Our business partner's expertise enabled them to give us proper suggestions.	☐	☐	☐	☐	☐
We usually got bad advice from our business partner	☐	☐	☐	☐	☐
This partner did what we anticipated because we had largely similar business philosophies.	☐	☐	☐	☐	☐

17) Interdependency (Caniëls & Gelderman, 2007)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner would be costly to lose.	☐	☐	☐	☐	☐
Our business partner would be easy to replace.	☐	☐	☐	☐	☐
We are dependent on our business partner.	☐	☐	☐	☐	☐

Our business partner would find it costly to lose us.	☐	☐	☐	☐	☐
Our business partner would find it difficult to replace us.	☐	☐	☐	☐	☐
Our business partner needs our expertise.	☐	☐	☐	☐	☐
Our business partner is dependent on us.	☐	☐	☐	☐	☐

18) Ability (Mayer & Davis, 1999)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner is very capable of performing its job.	☐	☐	☐	☐	☐
Our business partner is known to be successful at the things it tries to do.	☐	☐	☐	☐	☐
Our business partner has much knowledge about the work that needs to be done.	☐	☐	☐	☐	☐
I feel very confident about my business partner's skills.	☐	☐	☐	☐	☐
Our business partner has specialized capabilities that can increase our performance.	☐	☐	☐	☐	☐
Our business partner is well qualified.	☐	☐	☐	☐	☐

19) Benevolence (Mayer & Davis, 1999)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner is very concerned about our welfare.	☐	☐	☐	☐	☐
Our needs and desires are very important to our business partner.	☐	☐	☐	☐	☐
Our business partner would not knowingly do anything to damage us.	☐	☐	☐	☐	☐
Our business partner really looks out for what is important to us.	☐	☐	☐	☐	☐
Our business partner will go out of its way to help us.	☐	☐	☐	☐	☐

20) Integrity (Mayer & Davis, 1999)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
Our business partner has a strong sense of justice.	☐	☐	☐	☐	☐
I never have to wonder whether our business partner will stick to its word.	☐	☐	☐	☐	☐
Business partner tries hard to be fair in dealings with others.	☐	☐	☐	☐	☐

The actions and behaviors of our business partner are not very consistent.	☐	☐	☐	☐	☐
Like our business partner's values.	☐	☐	☐	☐	☐
Sound principles seem to guide our business partner's behavior.	☐	☐	☐	☐	☐

<< New section >>

The following statements are about the person with whom you collaborate most during this organizational collaboration. We would ask you to read the statements well and answer them STRONGLY AGREE = if you fully agree, and STRONGLY DISAGREE if you totally disagree.

21) Cognition-based trust (McAllister, 1995)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
The business partner's representative approaches his/her job with professionalism and dedication.	☐	☐	☐	☐	☐
Given my business partner's representative record, I see no reason to doubt his/her competence and preparation for the job.	☐	☐	☐	☐	☐
I can rely on my business partner's representative not to make my job more difficult by careless work.	☐	☐	☐	☐	☐
Other work associates of mine who must interact with my business partner's representative consider him/her to be trustworthy.	☐	☐	☐	☐	☐

If people knew more about my business partner's representative background, they would be more concerned and monitor his/her performance more closely.	☐	☐	☐	☐	☐
Most people, even those who are not close friends of my business partner's representative, trust, and respect him/her at work.	☐	☐	☐	☐	☐

22) Affect-based trust (McAllister, 1995)	STRONGLY AGREE	AGREE	NEUTRAL	DISAGREE	STRONGLY DISAGREE
We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.	☐	☐	☐	☐	☐
I can talk freely to my business partner's representative about the difficulties I am having at work and know that (s)he will want to listen.	☐	☐	☐	☐	☐
We would both feel a sense of loss if one of us was transferred, and we could no longer work together.	☐	☐	☐	☐	☐
If I shared my problems with my business partner's representative, I know (s)he would respond constructively and caringly.	☐	☐	☐	☐	☐
I would have to say that we have both made considerable emotional investments in our working relationship.	☐	☐	☐	☐	☐

Appendix 04d: Diagnostic Rules Trust and Interdependence

To be able to measure trust and interdependence, it is relevant that something is made that can identify whether there are points that require attention. Although the Likert statement is often used in mean, mode, and average, the hypothesis here is that the questions may be useful, but more information may be needed if a person completing these statements is neutral, negative or positive on a particular question. But going through 28 statements (Trustworthiness) or 19 statements (interdependence) is arbitrary and time-consuming, and therefore, to make these Likert statements more manageable, the idea of business rules was introduced. Business rules are the rules that are specified in the procedure and do not depend on human decisions (Hypský & Kreslíková, 2017), and therefore, would make the results more generalizable, adjustable, tracible and time-efficient.

- Generalizable: A rule is always the same, while human judgment is required by setting the business rule; these rules could be debated.
- Tracible: decisions as to why a statement is positive or negative can be traced.
- Time-efficient: Business rules can be automated, and therefore, could save time.
- Adjustable: a business rule does not have to be correct immediately, because they can be adjusted, this change can be easily documented because the user of the prototype starts with a list of rules that can be tracked and changed per Likert statement.

Typical examples of business rules are demonstrated below:

- IF actor A disagrees or strongly disagrees on the statement “Our business partner would be costly to lose.”, THEN a discussion is needed.
- IF actor A and actor B is are neutral on the statement, “Our business partner is well qualified,” THEN a dialogue is needed.

That is why I recommend that it is noteworthy to evaluate each individual response on every individual Likert statement and to flag each negative response as input for a discussion. The name "flag" is used when making business rules and implies that a particular statement (e.g., a column or record.). Thus, the use of business rules was employed, as business rules have a positive impact on the automation of business processes and, therefore, they are suitable for saving on the resources (Hypský & Kreslíková, 2017). This research used 2 business rules; one for a mutual comparison, and one for a comparison of the results per user. The rules are based on a 5-point Likert scale.

- IF there is more than 1 value number difference (e.g., respondent 1 replies strongly agree, and respondent 2 replies neutrally) between both comparisons, THEN a flag must be given to that statement.
- IF a statement is answered more negatively than neutral, THEN a flag must be given to that statement.

This is a list of rules drawn up for the comparison of trust and interdependence; rules are currently not calibrated further than it is found that there is a negative undertone.

We usually got bad advice from our business partner.	Our business partner's expertise enabled them to give us proper suggestions.	Our business partner convinced us that it made sense to follow their suggestions.	Our business partner has more useful information than us.	Our business partner will not give us necessary service if we do not meet their requests.	Our business partner usually suggest that they will increase the price if we do not meet their requests	We avoid many difficulties as we meet our business partners requests	We cannot gain their special treatment if we don't meet their requests.	We must comply with our business partner even if it is beyond the contract.	**Question**
Reverse	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	**coded**
IF the results are "agree" or "strongly agree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	**Rule**

Our business partner has much knowledge about the work that needs to be done.	Our business partner is known to be successful at the things it tries to do.	Our business partner is very capable of performing its job.	Our business partner is dependent on us.	Our business partner needs our expertise.	Our business partner would find it difficult to replace us.	Our business partner would find it costly to lose us.	We are dependent on our business partner.	Our business partner would be easy to replace.	Our business partner would be costly to lose.	This partner did what we anticipated because we had largely similar business philosophies.
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Reverse	Normal	Normal
IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.

My business partner tries hard to be fair in dealings with others.	I never have to wonder whether our business partner will stick to its word.	Our business partner has a strong sense of justice.	Our business partner will go out of its way to help us.	Our business partner really looks out for what is important to us.	Our business partner would not knowingly do anything to damage us.	Our needs and desires are very important to our business partner.	Our business partner is very concerned about our welfare.	Our business partner is well qualified.	Our business partner has specialized capabilities that can increase our performance.	I feel very confident about my business partner's skills.
Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.

I can talk freely to my business partner's representative about the difficulties I am having at work and know that (s)he will want to listen.	We have a sharing relationship. We can both freely share our ideas, feelings, and hopes.	Most people, even those who aren't close friends of my business partner's representative, trust, and respect him/her at work.	If people knew more about my business partner's representative background, they would be more concerned and monitor his/her performance	Other work associates of mine who must interact with my business partner's representative consider him/her to be trustworthy.	I can rely on my business partner's representative not to make my job more difficult by careless work.	Given my business partner's representative record, I see no reason to doubt his/her competence and preparation for the job.	My business partner's representative approaches his/her job with professionalism and dedication.	Sound principles seem to guide our business partner's behavior.	I like our business partner's values.	The actions and behaviors of our business partner are not very consistent.
Normal	Normal	Normal	Reverse	Normal	Normal	Normal	Normal	Normal	Normal	Reverse
IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "agree" or "strongly agree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	IF the results are "agree" or "strongly agree" on a positive statement about the business partner, then a diagnostic flag will arise.

I would have to say that we have both made considerable emotional investments in our working relationship.	Normal	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	
If I shared my problems with my business partner's representative, I know (s)he would respond constructively and caringly.	Normal	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	
We would both feel a sense of loss if one of us was transferred, and we could no longer work together.	Normal	IF the results are "disagree" or "strongly disagree" on a positive statement about the business partner, then a diagnostic flag will arise.	

Table 16 Diagnostic Rules Trust and Interdependence

APPENDIX 05: FEEDBACK FORM OF THE RELATIONAL CALIBRATION SURVEY

RCI - Satisfaction research

Thanks again for completing the RCI-prototype questionnaire. To follow-up on this research, I would like to know your honest opinion regarding the usability of the prototype, which consists of two activities.

Your opinion is an essential part of this research because Design science research strives to design a solution for a practical problem (which is that in many collaborations, poor scoping of roles and responsibilities leads to dissatisfaction within partnerships). Therefore the designed solution (an instrument that periodically assesses if both parties remain to have the same collaboration objectives) must be experienced as usable and used by the intended users.

Reading the comparison report takes approximately 5 to 10 minutes of your time, and filling the seven satisfactory questions takes another 5 minutes.

* Required

Questions about the RCI-prototype

Looking back at the given answers by yourself within this prototype, we would like to ask to what extent you are satisfied with the provided questions in this report. Could you please be so kind as to answer the following questions?

1. To what extent are you satisfied with the questions asked in the prototype to record the collaboration objectives? *

- ○ Not satisfied
- ○ Moderately satisfied
- ○ Completely satisfied

2. What is the primary reason for your score?

Enter your answer

3. To what extent are you satisfied with the questions asked in the prototype to record mutual dependencies between you and your partner? *

- ○ Not satisfied
- ○ Moderately satisfied
- ○ Completely satisfied

4. What is the primary reason for your score?

Enter your answer

Next

* Required

Questions about the RCI-collaboration report

The following four questions are about the answers that your business partner has provided in this report. Could you please be so kind as to answer the following questions?

5. To what extent has the report provided you with new insights into the perceived mutual responsibilities between you and your partner? *

- ○ little to none
- ○ moderate
- ○ very much

6. What is the primary reason for your score?

Enter your answer

7. To what extent has the report provided you with new insights into the perceived objectives of the cooperation of your partner? *

- ○ little to none
- ○ moderate
- ○ very much

8. What is the primary reason for your score?

Enter your answer

Back Next

9. Do you have any additional comments on the use of the prototype?

Enter your answer

10. What did you like least about the prototype, and why?

Enter your answer

11. What did you like most about the prototype, and why?

Enter your answer

Back Submit

Appendix 05b: Feedback Results from the Relational Calibration Survey

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APPENDIX 06: INTERFIRM TRANSACTIONAL RELATIONSHIPS

When organizations collaborate, business processes become, to some extent, aligned (Zhao et al., 2009). This alignment can be described from a perspective of transactional relationships. A transactional relationship is a blend of relational-, contractual- and operational realms, with each their perception of business partnerships (Verstegen et al., 2006). Figure 20 illustrates the dynamic links each realm has on the other as arrows A1 to C2.

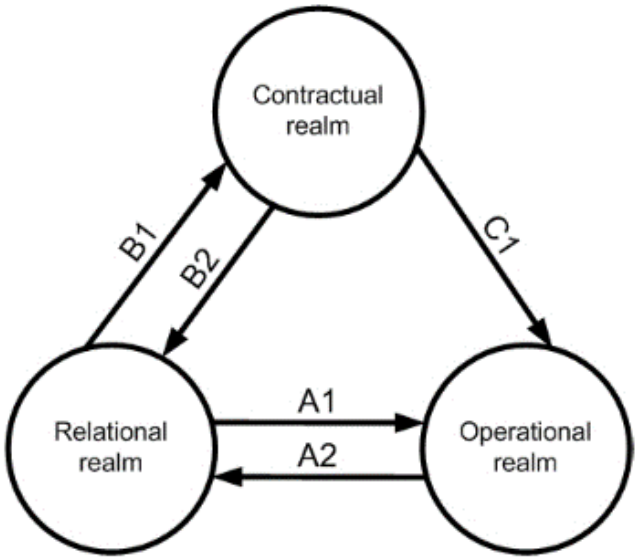

Figure 20 Dynamic Links Between Realms in Transactional Relationships

Business Processes are coordinated within the operational realm (Muit, 2018; Verstegen et al., 2006). Thus, when two parties collaborate, it is reasonable to assume that two processes must be combined; actors must reassess their activities, and a shift in roles and responsibilities may apply. Furthermore, while performance and business outcomes could previously be measured from within an organization (Davenport & Short, 1990), a collaboration may require to determine new performance criteria that pass through multiple departments of multiple organizations. Thus, when operations change, this often results in changes in responsibilities; consequently, contractual agreements may require a revision (Verstegen et al., 2006).

The legal bases for a transactional relationship are established in the contractual realm. However, these formally established agreements are often incomplete (Gelderman et al., 2015; Lane & Lum, 2011; Verstegen et al., 2006). Thus, when formal agreements are incomplete, an alternative must be established to guarantee that contracts are acknowledged, or adjusted to the new reality of the business process (Verstegen et al., 2006).

One of such alternatives is found in the relational realm, whereas relational dynamics focus on the nature of the relationship, mutual trust, signaling, and the underlying intentions of a business partner (Verstegen et al., 2006). Psychological contracts are typically a part of the relational realm and can be described as rational beliefs of

individuals on their psychological (rather than legal) obligations (Koh et al., 2004). Furthermore, Kingshott (2006) has found a positive correlation between psychological contracts and mutual trust (Kingshott, 2006), and precisely these psychological dimensions are seen as essential factors of partnership quality (Lane & Lum, 2011).

It is, however, in the relational realm that much knowledge can still be gathered, and the development of useful relational performance criteria remains a wish for many organizations (Martin, 2019).

APPENDIX 07: RELATIONAL CALIBRATION SURVEY RESULTS

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Appendix 07b: Discussion on the Usefulness of the Prototype

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Appendix 07c: Cross Comparison of Trustworthiness and Interdependence

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Table 17 Comparison of Likert Results (trustworthiness)

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Table 18 Comparison of Likert Results (interdependence)

Appendix 07d: Relational Calibration Survey Collaboration Report

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APPENDIX 08: INTERVIEWS AND BRAINSTORMING SESSIONS

This content is not available in this public version

Table 19 List of Interviewees in This Research

Appendix 08b: Brainstorming and Discussion on the used Matrix

Value through collaborations can be created in numerous ways, such as innovation, new knowledge, better performance, cost reduction, productivity, efficiency, or effectiveness (Lee, Heng, & Lee, 2009). During the design process, the idea was discussed that it is always a challenge in collaborations to align all stakeholders during a decision-making process.

And these categories were sketched into three value thinking concepts; optimizing effectiveness, optimizing efficiency, and optimizing costs. The predicament is that if the value is not explicitly defined, there is a chance that actors will communicate ambiguously, and decisions may even be incorrectly motivated. This reasoning was also reflected in, for example, the research of Koh et al. (2004) Figure 21 visualizes the discussed thinking phases in which an actor might consider during a decision-making process.

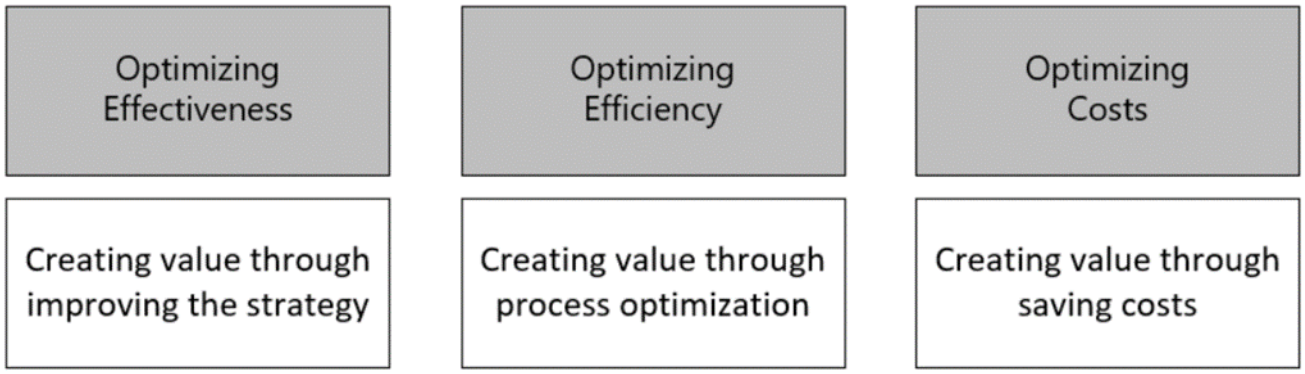

Figure 21 Value Thinking Ideas

The aim of the Relational Calibration Survey is that partners can communicate effectively from the outset of the success of a partnership, whereas the design principle sometimes referred to as the "Boehm's Law", states that a bad start lead to higher costs, thus, by identifying differences in objectives, dependency, roles, and responsibility at an early stage, even before an initiation of cooperation starts, leads to a reduction in failure costs.

Therefore, inspired by the value levels, three objectives in which collaboration could take place were created, for example; to create, to change, or to remove a business process. Thus, when a partnership is about to occur, it would be favorable that the partners recognize the same collaboration objectives, else they would not be efficient.

- When an objective is to "increase," something new will have to be developed, and will have to be made from scratch. This type of objective is characterized by the fact that a pure form of innovation is often needed, and that something must be developed that has not been done before. An example is when a collaboration partner would want to add specific business processes to increase operational efficiency (Božič & Dimovski, 2019), and the execution could be that new business processes must be created.

- Furthermore, the purpose of changing is that improvement must be made to a business process. This phase is characterized by something that already existed that needs to be changed and often aims at efficiency or effectiveness. Thus, the name "to change" was used in the prototype to address collaborations wherein optimizing internal business processes is the objective.
- Lastly, the objective of reducing is to do less than before. The objective is often cost reduction and may involve phasing out business processes or, for example, reducing staff. The difference between "changing" and "reducing" is that the primary purpose of "reducing" is a reduction, while "changing" often aims to improve. An example would be minimizing internal business processes, e.g., at a reduction in licensing costs, reduction of human capital, or the abandonment of specific Business Processes.

Moreover, collaborations in Business Intelligence & Analytics are often project-driven, and projects usually have a beginning and an ending. Phases of projects consist of an initiation, definition, execution, and closing phase (Bos et al., 2006). However, before a project starts, it must at least be ascertained that there is a problem for which it is thought that a project can be a solution. Bos et al. (2013) describe this phase as the improvisation phase or a creative process. The improvisation phase strives at obtaining a direction towards the solution, and the creative process aims at gathering insights on an issue upon which can be performed. Thus, it seems relevant that the collaborating organizations know in which phase they are cooperating, even if it is only to be able to recognize each other's expectations.

Thus, knowing the collaboration phase creates clarity. Therefore, when it is transparent to which direction the companies vision leans, it is necessary to understand to what extent the partner is inquired to work along. Consequently, in order to assess in which phase of the value creation process, the collaboration is scoped, and in which phases of the value creation process, the collaboration will remain. Thus, four collaboration phases were created; the brainstorming phase, the converging phase, the planning phase, and the executing phase.

- The brainstorming phase is divergent thinking in its purest form. The problem or challenge is apparent, but there is still little insight into what exactly needs to be achieved (Bos et al., 2013).
- In the converging phase, the ideas are estimated to be feasible and require a separate way of thinking. Bos et al. (2013) suggest that the actors involved in the planning phase, such as project managers, should get involved.
- The planning phase starts when it is understood what needs to be done and starts often based on a business case. The actors start arranging resources, focuses on the development of a roadmap, and ideas are converted into an implementation plan.
- The execution phase is the last phase of an initiative, and operations are executed in this phase. Actors work towards the realization of the converged ideas by following the plans created in the planning phase.

This resulted in Figure 7 Relational Calibration Matrix. The Relational Calibration Matrix serves a different goal, namely, to identify in what phases a collaboration takes place, and what the operational objectives of such collaboration are. Therefore, the phases and goals of the partnership, wherein the objective of the initiative are outlined on the vertical axis, and the phases of the objective, are plotted on the horizontal axis.

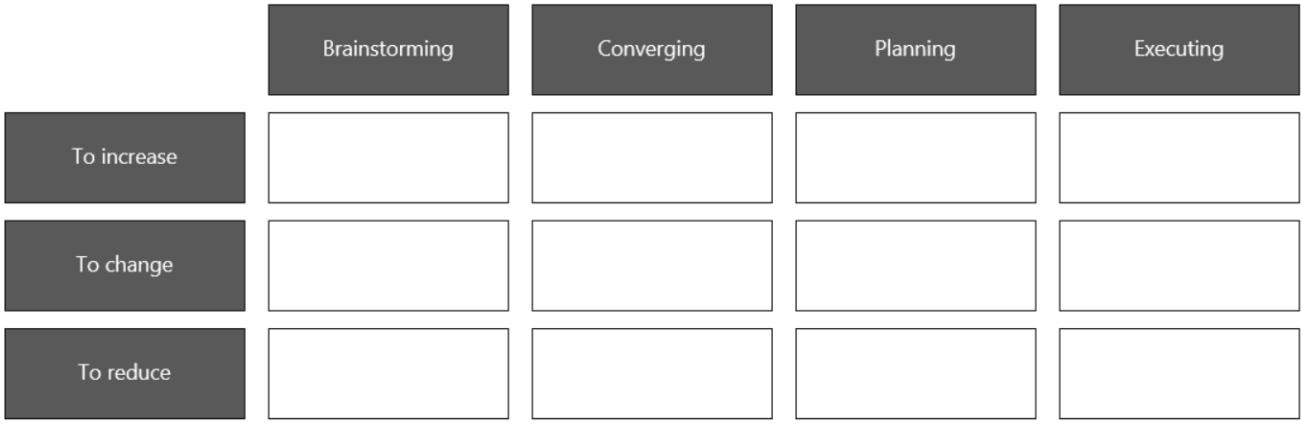

Figure 22 Relational Calibration Matrix: Collaboration Value Level and Collaboration Phases

Hypothetic use of the Relational Calibration Matrix

To illustrate the use of the matrix, this paragraph projects the research environment. On the first question "Which of the following statements best describes the goal of the initiative?", both users of the Relational Calibration Survey stated, "...to increase: We aim to develop something innovative, or in other words to increase or to develop something that has not been done before within the organization (e.g., the development of a new department.)". Figure 23 visualized the results of both partners and showed that both are aligned with the objective of the collaboration, without being clear whether they envisage the same method of achieving that goal.

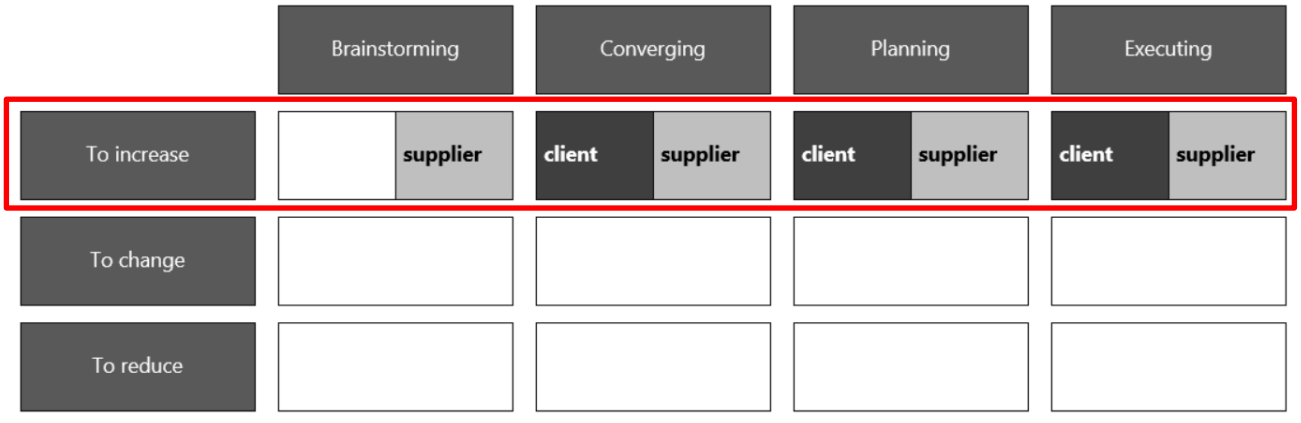

Figure 23 Objective of a Collaborations that did Align

Secondly, the vertical axis, which can be filled with the response given to the question “Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)?”. The results of this question are illustrated in Table 20 below.

Partner A	8. Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)? ☐ We expect our partner to support us to think about potential objectives of the initiative. ☑ We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative. ☑ We expect our partner to support us to draw up the plan for achieving these objectives. ☑ We expect our partner to help us with the implementation of these objectives.
Partner B	8. Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)? ☑ We expect our partner to support us to think about potential objectives of the initiative. ☑ We expect our partner to support us to turn the brainstormed ideas into feasible objectives for the initiative. ☑ We expect our partner to support us to draw up the plan for achieving these objectives. ☑ We expect our partner to help us with the implementation of these objectives.

Table 20 Relational Calibration Survey: Results on the Vertical Axis

Both respondents did not give the same results on the question “Read the description of the phases below, which of the phases below indicate in which you expect to work together with your business partner (multiple phases possible)?” since one of the respondents also answered to collaborate during the brainstorming phase while the other did not. The potential problem here is that one of the two parties can withhold resources while that was not necessary, and by identifying this difference, both parties can better anticipate each other.

Figure 24 Phases of a Collaborations that did not Align

APPENDIX 09: SYSTEM TESTING TECHNICAL REQUIREMENTS

System testing is a level of testing that validates the complete and fully integrated Relational Calibration Survey. This means that these tests check whether the Relational Calibration Survey can perform what it ought to perform before further tests could be performed.

5. The Relational Calibration Survey must have the functional capability to request open-ended questions.
6. The Relational Calibration Survey must have the ability to record questions so that it is possible to analyze and validate the data from the prototype afterward.
7. The Relational Calibration Survey must have the ability to create data that creates comparable results.
8. The Relational Calibration Survey must have the ability to be used without assistance.

Conclusion

The prototype has the functional capability to request open-ended questions and records all the responses of the users in a spreadsheet. However, not all technical requirements could be compared with each other; thus, the prototype has not the ability to create data that create comparable results, because open-ended questions are hard to compare, and need plenty of validation. Nevertheless, the use of the Relational Calibration Survey is self-explanatory. All questions asked in the Relational Calibration Survey were understood, and the responses were during the discussion session confirmed by the actors within the research environment.